TOOELE ARMY DEPOT

Tooele, Utah

Monitoring Well D-19 Completion Report Phase II RFI Groundwater Investigation

Contract Number: GS-10F-0179J

Submitted to:

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February 2006

Prepared by:

PARSONS and KLEINFELDER

Salt Lake City, Utah

MONITORING WELL D-19 COMPLETION REPORT
PHASE II RFI GROUNDWATER INVESTIGATION
TOOELE ARMY DEPOT
TOOELE, UTAH

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ABBREVIATIONS AND ACRONYMS

µg/L ..... micrograms per liter
API ..... American Petroleum Institute
ASTM ..... American Society for Testing Materials
bgs ..... below ground surface
btoc ..... below top of casing
CTC ..... carbon tetrachloride
DWR ..... Division of Water Resources
gpm ..... gallon per minute
IWL ..... Industrial Wastewater Lagoon
MCL ..... maximum contaminant limit
NAD ..... North American Datum
NEB ..... Northeastern Boundary Plume
NGVD ..... National Geodetic Vertical Datum
NTU ..... nephelometric turbidity unit
NPL ..... National Priorities List
PDB ..... passive diffusion bag
PID ..... photoionization detector
ppm ..... parts per million
PVC ..... polyvinyl chloride
RCRA ..... Resource Conservation and Recovery Act
RFI ..... RCRA Facility Investigation
STL ..... Severn Trent Laboratories
SWMU ..... Solid Waste Management Unit
TCE ..... trichloroethene
TEAD ..... Tooele Army Depot
UAC ..... Utah Administrative Code
UDEQ ..... Utah Department of Environmental Quality
UID ..... Utah Industrial Depot
USACE ..... United States Army Corps of Engineers
USCS ..... Unified Soil Classification System
USEPA ..... Environmental Protection Agency
VOA ..... volatile organic analysis
VOC ..... volatile organic compound
WW ..... water well

1. INTRODUCTION

This report contains detailed information regarding the drilling, construction, development, and sampling of groundwater monitoring well D-19, located northeast of the Tooele Army Depot, Utah (TEAD). This report was prepared for the US Army Corps of Engineers (USACE), Sacramento District, under Contract GS-10F-0179J, on behalf of TEAD by Kleinfelder, Inc., (Kleinfelder) and Parsons in Salt Lake City, Utah.

TEAD is an active military facility located approximately 35 miles southwest of Salt Lake City, Utah (Figure 1.1) and it has been in operation since 1942. TEAD has been a primary storage, maintenance, and disposal facility for conventional munitions since its inception. Due to impacts to groundwater quality resulting from this activity, TEAD was added to the National Priorities List (NPL) under the federal Superfund program in October 1990.

1.1 BACKGROUND INFORMATION

Historical wastewater discharged to the unlined Industrial Wastewater Lagoon (IWL) at TEAD resulted in a large impacted groundwater plume beneath the eastern portion of the Depot. A large number of monitoring wells, piezometers, extraction wells, and injection wells have defined a trichloroethene (TCE) plume along downgradient, northern, and western extremes of the Depot. This occurrence of impacted groundwater was designated the Main Plume.

In 1986, TCE was detected in an off-site production well located north of the Industrial Area, approximately 5,000 feet (ft) northeast of the IWL. In 1994, well C-10 was installed at the northeastern boundary of the Depot. TCE was detected at a concentration of approximately 240 micrograms per liter (µg/L) in groundwater sampled from well C-10, located directly across the road from the impacted off-site production well (Kleinfelder, 1998).

Additional groundwater investigations were conducted to further assess the nature and extent of groundwater contamination at the northeastern boundary of TEAD. These additional investigations indicated that the contamination in well C-10 and the adjacent off-site production well had likely originated from a source different from that attributed to the Main TCE plume. Thus, two plumes of groundwater contamination were indicated. This second, more easterly plume, was designated the Northeastern Boundary (NEB) Plume. The oil-water separator at Building 679 in the former industrial area (now the privately owned Utah Industrial Depot [UID]) was identified as a major source of this plume (Kleinfelder, 2002).

A subsequent investigation was designed to define the approximate off-site extent of the NEB Plume. The plume, which is relatively narrow beneath the former industrial area, extends

approximately 16,000 ft downgradient (to the north) from the identified source at Building 679 (Parsons, 2003a). The installation of groundwater monitoring well D-19 was conducted in accordance with the Phase II Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Solid Waste Management Unit (SWMU) 58 Work Plan (Parsons, 2003b) and Work Plan Sampling and Analysis Plan Addendum 1 (Parsons, 2004) that were approved by the USACE and the State of Utah Department of Environmental Quality (UDEQ) prior to initiating fieldwork.

1.2 PROJECT PURPOSE AND SCOPE

Monitoring well D-19 is one of fifteen groundwater monitoring wells installed between September 2004 and September 2005 during the Phase II RFI at SWMU 58. SWMU 58 encompasses the source areas and the areas impacted by the Main and NEB TCE Plume. Objectives of the groundwater investigative component of the Phase II RFI are to:

- Refine the vertical limits and lateral extent of the Main and NEB chlorinated solvent plumes;
- Further characterize the distribution of contaminants within the plumes;
- Ascertain whether there are additional contaminant sources to the NEB Plume and assess their impacts to groundwater;
- Assess the risks to human health associated with the unmanaged (off-site) portion of the NEB Plume; and
- Refine the existing numerical groundwater flow and solute transport models with respect to fate and transport, in order to better predict the potential extent (stability) of the plume in the future.

Investigative efforts described in this completion report were supervised by a State of Utah-registered Kleinfelder geologist who was present for critical on-site activities. Before drilling began, a land lease (access and well easement agreement) was negotiated with the property owner, Perry/Tooele Associates, LLC, and a permit for well installation was obtained from the State of Utah Division of Water Rights (DWR). Copies of the lease agreement, the Parsons "request for authorization to drill" and DWR "authorization" letters, Applicant Start Card, and Driller (Start) Card are included in Appendix A. Underground utility clearance was obtained through the Blue Stakes Location Center.

To minimize the danger of wildfire due to drilling activities, Parsons personnel cut the cheat grass within a 75 foot radius around the well site, and also along the access routes to the proposed well. During drilling, a 750-gallon capacity water buffalo was stationed adjacent to the drill rig in the event that a fire did accidentally start.

Monitoring well D-19 was drilled, constructed, developed, and sampled between July 13, 2005, and July 20, 2005. Drilling and construction activities were conducted by Layne Geoconstruction (Layne) of Salt Lake City, Utah. Following completion of the well, Layne issued a Well Driller's Report, which is also included in Appendix A. Well development and groundwater sampling were completed by Veolia Water North American Operating Services, LLC, which operates the groundwater treatment plant at TEAD. Laboratory analyses were provided by Severn Trent Laboratories (STL) of West Sacramento, California, a State of Utah, and a USACE-certified analytical laboratory. Down-hole geophysical logging was performed by RAS, Inc. of Golden, Colorado. Transport of suspect hazardous drill cuttings and potentially impacted groundwater generated during drilling and well development to the UID 90-day yard was provided by MP Environmental of Grantsville, Utah.

Monitoring well D-19 is located in the NW ¼ of Section 7, T3S, R4W, Salt Lake Base and Meridian. This well is accessed from Sheep Lane along the abandoned railroad grade, and then via a dirt/gravel road that accesses monitoring wells D-03, then northeastward along a dirt track to well D-07, then northwestward about .5 mile to a short spur that leads to the wellsite (Plate C-3).

The primary purpose of monitoring well D-19 was to better define the approximate margin of the NEB Plume as designated by the 5 µg/L TCE isoconcentration contour. That concentration represents the maximum contaminant level (MCL) for TCE. A secondary objective was to assist, in conjunction with other proximal wells, in determining the hydraulic gradient and groundwater flow direction in this portion of the plume (Parsons, 2003b).

2. DRILLING, SEDIMENT SAMPLING, AND LOGGING METHODS

2.1 DRILLING

Groundwater monitoring well D-19 was drilled by Layne Geoconstruction of Salt Lake City, Utah, between July 13 and July 14, 2005 using a Becker AP-1000 percussion hammer drilling rig manufactured by Drill Systems. The AP-1000 advances a dual-walled 10-inch diameter drill pipe into the subsurface by means of a diesel-powered pile hammer. Circulating air is pumped down the space between the inner and outer walls of the drill rod to the drill bit, where formation cuttings are picked up and carried back through the center of the drill rod and out of the borehole as the air returns to the ground surface. Cuttings are separated from the discharging air by a cyclone. Dry cuttings were collected and spread on the ground around the well site, whereas saturated cuttings were contained in 55-gallon drums pending analytical results.

2.2 SAMPLING OF DRILL CUTTINGS

Cuttings were observed continuously as they discharged from the cyclone and were collected in 1-quart bags and chip trays. The cuttings were logged at 5-foot intervals or when significant changes in lithology occurred. Drive sampling, used in previous boreholes drilled as part of this program, was rarely successful due to refusal in coarse sediments and inability to anticipate encountering thin, fine-grained layers. Thus, a more accurate and complete borehole log resulted from continuous observation of cuttings from the cyclone.

Drill cuttings were logged using the American Society for Testing Materials (ASTM) Method D2488-00. The Unified Soil Classification System (USCS) was used for designating the various types of unconsolidated material encountered. Where a conflict between the two methods was identified, the ASTM convention took precedence. Color of the drill cuttings (when wetted) was noted by referencing the Munsell color chart system. Estimated percentages of gravel, sands, and fines; degree of roundness and lithology/mineralogy of any gravel clasts; moisture content; degree of cementation; and any other notable attributes were routinely recorded in the sample description. The Becker Hammer Drilling method allows for a maximum clast size of about 6 inches to pass through the drill pipe to the surface, so while boulders and cobbles exceeding this dimension may exist, their percentages cannot be estimated.

Grab samples of drill cuttings from below the saturated zone were logged and screened for volatile organic compounds (VOCs) using a photoionization detector (PID). PID readings were also included on the boring log. PID readings from the grab samples from this boring ranged from 0.0 to 0.2 parts per million (ppm). A composite of these samples was submitted for VOC analysis, which was used to determine the proper means of disposal for all saturated cuttings

from this borehole. Saturated drill cuttings were containerized in 55-gallon drums and transported to the UID 90-day yard to await analysis.

2.3 RECORD KEEPING

While on site, Kleinfelder's geologist maintained records of all activities in a bound field logbook, on Daily Field Report forms, Drill Rig Inspection forms, Safety Meeting Forms, and Equipment Calibration Logs. Copies of these records are presented in Appendix B.

3. SUMMARY OF SUBSURFACE CONDITIONS

3.1 GEOLOGIC LOG

A Kleinfelder geologist was on-site during drilling to collect samples of drill cuttings in order to maintain a continuous geologic log of the subsurface conditions that were encountered. Lithologic descriptions and the geologist's observations were entered onto the geologic log. The geologic log of the cuttings that were sampled during drilling of the monitoring well D-19 borehole is included in Appendix C.

The unconsolidated sediments intersected in D-19 can be divided into three major sequences based on depositional environment. The uppermost assemblage is represented by approximately 20 ft of silty gravel (GM) and well-graded gravel (GW) that collectively are believed to represent late and/or post-Lake Bonneville alluvial fan deposits. The base of this gravel sequence is in sharp contact with the middle sequence: a section of Late Pleistocene lacustrine sediments present between 20 and 43 ft below ground surface (bgs) that is the product of deposition within Lake Bonneville. From ~43 ft to the bottom of the boring at 170 ft the sediments consist largely of pre-Bonneville alluvial fan deposits. The lacustrine and lower alluvial fan sequences are described in greater detail below.

The top of the lacustrine sequence is marked by a sharp contact that separates overlying coarse-grained gravels of probable alluvial fan origin from a thin (20-21ft bgs) gravelly clay (CL) unit. The latter is interpreted to be a deep water lacustrine facies that is correlative with the lean clay interval (CL) that occurs at the top of well D-18. The higher gravel content in D-19 is posited to reflect a greater proximity to the lakeshore and alluvial fan sediments. The contact at 20 ft bgs that defines the top of the gravelly clay unit is inferred to be the product of erosion, since the regressive lacustrine sequence that should lie above the clay, and mark the transition to the overlying alluvial fan gravels, is either missing due to erosion and/or sediment reworking.

Underlying the gravelly clay (20-21 ft bgs) is a well-graded sand with gravel (SW) unit that is posited to represent lacustrine sediments that were deposited in a shallower environment than the overlying clay unit.

The lowermost lacustrine unit is a lean clay (CL) interval about 9 ft thick (34-43 ft bgs) that probably formed in a deep water environment similar to the gravelly clay interval at 20-21 ft bgs. The sharp contact between the overlying sand with gravel (SW) unit and the lean clay at 34 ft bgs is interpreted as having formed from erosion owing to the virtual absence of coarse detritus within latter. Moreover, the basal contact for the lean clay (at 43 ft bgs) may also be the product of erosion due to the absence of any as coarser-grained lacustrine sediments that would have been deposited during the transgression of the lake.

Silty to well-graded gravels comprise about 85% of the pre-Lake Bonneville (lower) alluvial fan gravel sequence, within which the boring was terminated. The majority of the coarse-grained sediments consist of sub-rounded to sub-angular clasts of quartzite and limestone that appear water-worn. While some angular clasts are observed, these are likely products of the mechanical breaking caused by the drilling method. Cobbles are abundant. The coarser-grained sediments, including gravels with a significant fine-grained or clay component, are interpreted to have been deposited in a dynamic, high-energy depositional environment of coalescing alluvial fans. They may represent several types of alluvial fan deposits, including debris flow, stream channel, sheetflood, and sieve, that have been defined by Collinson (1978) based on depositional process, location on the fan, deposit morphology, degree of sorting and bedding, etc.

Intervals of less permeable sediments containing at least a significant fine-grained component were encountered at depths of 51-53, 60-64, 70-74, 90-95, 101-102, 108-123, and 151-155 ft bgs as indicated on the geologic log. The majority of these occurrences (at 52, 60-64, 70-74,90-95, 100-102, and 107-111, 111-123, and 152-155 ft bgs) are marked by a measurable clay-size fraction. Most consist of variable amounts of clay ± gravel and are less than 5 ft thick. The genesis of these less permeable, finer-grained deposits remains unclear, although it is conjectured that collectively they likely developed from more than one depositional process and in different environments or portions of the alluvial fan. Some occurrences may represent debris flows (Collinson, 1978) and/or possibly stream overbank deposits. Thicker intervals may be of lacustrine (playa lake) or floodplain origin. The anomalous thickness of the lean clay zone with minor coarse clastics at 111-123 ft bgs suggests a possible playa lake depositional environment.

The geologic log also indicates some variably caliche-cemented zones were encountered during drilling at depths of 53-54, 147-151, and 155-161. No bedrock was encountered during drilling of monitoring well D-19.

Free water from the cyclone was first observed at approximately 140 ft bgs. Following well construction and development, the depth to water was measured at 130.81 ft below top of casing (btoc) (128.05 ft bgs) by Veolia Water. Although the potentiometric surface in this well lies approximately 12 ft above the first appearance of water during drilling, there is no evidence that regional valley fill aquifer at this well site is semi-confined, as is the case at downgradient wells D-17 and D-18. Nevertheless, at some time in the past when groundwater levels in Tooele Valley were higher, the aquifer at this location may have been semi-confined owing to the presence of the lean clay unit at 111-123 ft bgs. No occurrences of perched water were encountered during drilling of monitoring well D-19.

3.2 GEOPHYSICAL LOGS

As a secondary interpretive tool, down-hole geophysical logging of monitoring well D-19 was completed within the polyvinyl chloride (PVC) cased well following construction. Natural gamma ray (gamma) and induction electric (induction) logs were run simultaneously by RAS on September 10, 2005 using a combination gamma ray-induction tool manufactured by Century Geophysical Corporation of Tulsa, Oklahoma. The gamma and induction logs for this well are contained in Appendix C. Data validation was attained via a repeat logging run of a selected stratigraphic interval within the well.

The former logging technique measures the natural gamma emissions emanating from the formation surrounding the borehole. This radiation is released from nuclei of an unstable element decaying to a more stable element. Potassium 40 is the element responsible for most of the gamma radiation detected by the gamma ray probe. This element is very abundant in a number of rock-forming minerals, such as potassium feldspar, that weather to clays. Thorium- and uranium-bearing minerals also produce a gamma ray response, but in most geologic environments, including the unconsolidated valley fill deposits at the project site, the potassium-40 isotope is most abundant. Hence, as the clay content of the sediment increases, the gamma ray response also increases. Conversely, the gamma response becomes progressively weaker as the quartz content of the sediment increases. A comparison of this and other monitor well boring logs with their respective gamma ray logs shows a very strong correlation between finer-grained, clay-rich units and gamma ray peaks. Slight offsets between a gamma peak and the location of the fine-grained interval are attributed to an inability to define the exact depths of unit contacts owing to the time required for the cuttings to travel up the borehole and reach the surface. The measurement scale of the gamma-ray log is in American Petroleum Institute (API) units, accepted as the international reference standard that allows consistent comparisons to be made between a wide variety of gamma-ray counting devices.

For monitoring well D-19 the gamma ray response was typically between 100 and 120 API units. The minimum value was about 85 API units and the maximum readings about 200 API units (at approximately 35 ft bgs). Nine clay-rich units (at 20-21, 34-43, 52-53, 60-64, 70-74, 90-95, 100-102.5, 111-123, and 151-155 ft bgs) were identified during the logging of this boring. Gamma peaks were associated with seven of these occurrences. The strongest response is coincident with a 9-foot thick lean clay zone at 34-43 ft bgs. No obvious peaks were identified for the clayey gravel at 100-102 ft bgs and silty clay with gravel at about 151-155 ft bgs. Possible explanations for the apparent absence of elevated readings may be attributed to one or more factors including clay mineralogy (e.g., a lack of potassium-bearing clay minerals such as illite). A few weak to moderate gamma anomalies were recorded within gravel units. These peaks may reflect a very local increase in the clay content of the gravel, or the presence of a few volcanic or intrusive clasts that contain biotite or potassium feldspar.

The induction log measures the conductivity from high frequency alternating currents that are induced into the geologic formation, and is best suited where the formation is characterized by low to medium (less than 50 ohm-meters) resistivity values, the geologic medium exhibits medium to high porosity, and the open borehole was advanced using mud or air as the drilling fluid. Induction logging can be performed in boreholes cased with PVC, but not with steel pipe. Although the induction device measures conductivity, by convention, the conductivity readings are converted to a resistivity curve when plotted on a down-hole log via a simple inverse relationship.

Three curves are shown on the induction logs that were run by RAS. They represent the direct conductivity (millimhos/meter) readings as designated by a dashed ("cond") curve on the plot, a conductivity ("ap-cond") curve designated by a dotted line that has been corrected for the temperature of the induction probe, and resistivity (ohm-meters) measurements derived from a conversion of the temperature-corrected conductivity readings that are depicted as a solid ("res") line on the induction log plot. Note that although the conductivity and resistivity curves appear to mimic one another, the scales for the two properties are reversed since their relationship is an inverse one.

The variable induction electric responses within this well largely reflect differences in porosity, and moisture and clay content of the sediments.

The resistivity log shows values range from about 3 and 15 ohm-meters, with most readings between about 7 and 12 ohm-meters. The curve is punctuated by numerous highs and lows. Virtually all of the resistivity highs occur within the coarser-grained sediments or the two major caliche-cemented zones present below 145 ft bgs. Conversely, the most pronounced lows are associated with clay-rich intervals.

The temperature-corrected conductivity curve fluctuates between about 70 and 310 millimhos/meter. Background readings fall between about 70 and 120 millimhos/meter. All of the conductivity highs (~80-310 millimhos/meter) are associated with clay-rich sediments. The strongest conductivity response is associated with the lean clay unit at 34-43 ft bgs.

In summary, the induction electric logs in conjunction with the gamma log provided independent verification of less permeable clay-rich units and major caliche-cemented zones intersected in this well. The induction logs were more effective than the gamma log in identifying the intervals of clay-rich sediment, in part because induction logging is very accurate for geologic units having medium to low resistivity. Another explanation for the greater efficacy of the induction logs may be variable mineralogy (and potassium content) of the finer-grained units, producing gamma responses of differing intensities. Moreover, as would be expected, only the induction

logging identified the caliche-cemented zones. However, at least a few induction anomalies cannot be correlated with any clay-rich or caliche-cemented zones. Likewise, a number of weak to moderate gamma peaks do not appear to correlate with known clay-rich intervals based on the geologic logging.

3.3 HYDROSTRATIGRAPHIC SECTION

To aid in understanding the subsurface geology and water table configuration in the vicinity of this monitoring well boring, the geologic log for well D-19 was plotted on a straight line cross section (D – D') trending southwest-northeast over a distance of approximately 8,000 ft. This section also is defined by monitoring wells D-08, D-10, D-17, and D-18 (Plate C-4). Well D-10 is the only well not projected onto the section; projection distances for the other wells are provided on the cross section. The cross section location is illustrated on Plate C-3.

The cross section has differentiated between dominantly fine- and coarse-grained sediments, but not between sediments deposited in an alluvial fan as opposed to a lacustrine depositional setting. Sediments posited to be of Late Pleistocene age and lacustrine origin are represented by the following solid yellow intervals on cross section D – D': both intervals shown for D-10; and the uppermost interval depicted for wells D-8, D-18, D-19, and D-17.

Note that the inferred thickness of the lacustrine sediments at well D-19 as discussed in the text is greater than what is depicted in the simplified strip log for that well. D-19, because the well graded sand with gravel (SW) unit that is believed to comprise the top of the lacustrine sequence (from 21 to 34 ft bgs) has been included within the coarser-grained sediment category on the cross section.

As shown on the cross section, a unique aspect of the stratigraphy in D-19 is that gravels of presumed alluvial fan origin overlie the lacustrine sediments in that well. This stratigraphic relationship has not been observed in any other monitoring wells installed in the off-site area. It is posited that in the Late Pleistocene, D-19 was situated somewhat closer than either D-17 or D-18 to the encroaching alluvial fan deposits that advanced to the northwest as Lake Bonneville regressed. The alluvial fans advanced sufficiently to the northwest to bury exposed lacustrine sediments at D-19, but evidently not so far as to deposit gravels at either D-17 or D-18. (The possibility of alluvial fan deposition at both well sites followed by erosion of those gravels cannot be dismissed, but is considered unlikely given the time required.) Note that the ~20 foot difference in ground surface elevation between D-19 and D-17/D-18 represents the thickness of the post-Bonneville silty or well graded gravels of inferred alluvial fan origin encountered at the top of well D-19.

Although not illustrated on the cross section, thus far no evidence has been found to suggest that the Lake Bonneville deposits have been offset by younger, possibly reactivated Basin and Range

faults in the project area. Obtaining a better understanding of the lacustrine stratigraphy and sedimentation as they relate to the development of Lake Bonneville may assist in interpreting depositional environments represented in the older dominantly alluvial fan deposits, and possibly provide evidence for or against post-Lake Bonneville faulting in Tooele Valley.

Finally, a few comments regarding the challenge of correlating fine-grained and/or clay-rich units between wells within the NEB area are presented. Limited study of geologic logs for these wells suggests that the fine-grained or clay-rich intervals within the pre-Lake Bonneville dominantly alluvial fan valley fill sediments have limited lateral continuity, and generally cannot be correlated with any confidence between individual wells. Exceptions to this assessment may be those units that approach or exceed a specific thickness, say 10 ft.

The difficulty in correlating distinct fine-grained units is not surprising, given that the unconsolidated valley fill within SWMU-58 was largely deposited in a dynamic high energy depositional environment of coalescing alluvial fans. Fine-grained units deposited under such conditions are characterized by limited thickness and areal extent, and this also appears to hold true for the project area, in addition to well boring D-19. Many of the fine-grained silt- and/or clay-rich intervals pinch out over a few hundred feet due to a change in the depositional environment.

Another plausible explanation for limited areal extent of fine-grained and/or clay-rich units is post-depositional erosion and sediment reworking. Channel erosion is strongly suspected of causing the substantial difference in the thickness of a clay-rich lacustrine or floodplain deposit encountered in two closely spaced borings at Building 600 in UID. It almost certainly has been operative elsewhere.

There is another factor that may impede correlation of fine-grained units in this and other Phase II RFI groundwater monitoring wells. Most of these fine-grained units, even if they exhibit some lateral extent, were generally deposited on alluvial fan surfaces that are inclined several degrees or more. Over a distance of just a few hundred feet, a dip of even a few degrees translates into a change in elevation of up to 10 ft or more. Moreover, for monitoring wells spaced a thousand feet or greater, which is not atypical for the groundwater monitoring array at TEAD, differences in the elevation of a laterally continuous unit could be on the order of several tens of feet in adjacent wells.

As per the fine-grained units, little success has been achieved attempting to correlate caliche-cemented zones that occur primarily in the gravels. The same general comments presented above for fine-grained sediment deposits also apply to correlation of cemented zones. The ability to correlate both fine-grained sediment units and cemented zones between monitoring wells in the project area may be contingent upon distinct downhole gamma and induction electric log signatures.

4. WELL CONSTRUCTION SUMMARY

4.1 CONSTRUCTION TECHNIQUES AND MATERIALS

During drilling of monitoring well D-19, the 10-inch Becker Hammer drive casing was advanced to a depth of approximately 170 ft. Well construction occurred on July 14 through July 18, 2005, inside the cased borehole. Two 10-foot sections of threaded, 4-inch diameter Schedule 40 PVC well screen with 0.010-inch wide slots and 15 10-foot sections of 4-inch diameter Schedule 40 PVC blank casing were assembled and lowered inside the drive casing to the bottom of the borehole. The screen extends from 148 ft to 168 ft bgs over an interval consisting primarily of well graded gravel with sand and silt (GW-GM), that locally is weakly caliche-cemented. A 4-foot interval of silty clay with gravel (CL) is also screened. The well riser consists of 2.76 ft of aboveground blank well casing.

Silica sand (16-40) was added to the annulus between the PVC and the borehole in the interval adjacent to the well screen. To help minimize the risk of bridging and to confirm that the correct volume of sand was added, the sand was poured slowly into the annulus from the surface and continuously monitored until the top of the sand interval was approximately 3 ft above the top of the screen. The sand-pack interval was isolated from upper portions of the borehole with a 5-foot thick seal of bentonite clay pellets. The remaining annulus above the bentonite clay pellets was grouted to approximately 30 inches bgs with 30 percent solids bentonite slurry in accordance with Utah Administrative Code (UAC) R655-4-9.4.2. Following completion, the bottom of the well was tagged at a depth of 168.39 ft bgs. A well construction diagram is provided in Appendix D.

4.2 SURFACE COMPLETION AND SURVEY COORDINATES

A locking, 6-foot long, 10-inch diameter protective casing was placed around the uppermost part of the monitoring well casing, with approximately 3 ft above and 3 ft below ground. Concrete was used to partially fill and anchor the protective casing, fill the upper 5 ft of the borehole annulus, and build a 3-foot square by 1-foot thick pad (6 inches above ground surface) around the finished well. The concrete pad was finished to slope away from the protective casing and was embedded with a brass survey monument.

Four 4-inch diameter steel bollards were positioned around the pad to protect it from vehicular traffic. The bollards stand approximately 4 ft above the ground surface and extend about 2 ft bgs into concrete-filled post holes.

Ward Engineering Group of Salt Lake City, Utah, surveyed the well on July 29, 2005. Coordinates for the well locations are referenced to the North American Datum (NAD) 1983

Utah State Plane Central Zone and the elevation to the National Geodetic Vertical Datum (NGVD) 1929. Survey data are included in Appendix D.

5. WELL DEVELOPMENT

Groundwater monitoring well D-19 was developed using swabbing, bailing, and pumping methods on July 20, 2004. Development continued for approximately 5 hours and 46 minutes until the turbidity of the water produced was less than five nephelometric turbidity units (NTUs). All development water was collected and contained for later disposal pending analytical results (see Section 7.3). Well development records are included in Appendix E.

5.1 SWABBING AND BAILING

Swabbing and bailing took place for 2 hours and 45 minutes. Swabbing was done with a loose fitting surge block with an oversized rubber disk, slightly smaller than the inner diameter of the screen. Periodic measurements of pH, temperature, electrical conductivity, turbidity, and comments regarding the appearance of discharge water were recorded on well development records (Appendix E). About 120 gallons of water were removed from well D-19 by bailing during development.

5.2 PUMPING

After swabbing and bailing the well, development was completed using an electric submersible pump. The pump was lowered to the bottom of the screened interval and operated intermittently at rates ranging from 10.05 to 10.18 gallons per minute (gpm) for 2 hours and 13 minutes. During development pumping, the pump was periodically shut off and the water in the discharge piping was allowed to back-flush (surge) into the well. Pumping and periodic back-flush surging was continued until there was no noticeable increase in the discharge water turbidity. Periodic measurements of pH, temperature, electrical conductivity, turbidity, and comments regarding the appearance of discharge water were recorded on well development records. An estimated 990 gallons of groundwater were removed by development pumping. The final turbidity was measured at 2.01 NTU.

A drawdown-recovery test was performed during the pumping portion of the development of D-19 (Appendix E). A maximum drawdown of 0.10 ft was recorded after one minute of pumping at 10.05-10.18 gpm. Drawdown was recorded frequently over a pumping duration of 37 minutes, but drawdown did not increase. Recovery to the original (pre-pumping) water level occurred within one minute. The hydraulic response for this well (i.e., limited drawdown in a very short pumping time [~1 minute] to reach steady state) is consistent with a well-graded gravel with sand (GW) formation opposite the screen at the pump intake (~167 ft bgs).

6. GROUNDWATER SAMPLING

6.1 SAMPLING METHODOLOGY

Monitoring well D-19 was sampled using passive diffusion bag (PDB) sampling techniques. PDB sampling is performed without purging and involves lowering a polypropylene bag filled with distilled water to a predetermined depth. Once in place, the water within the PDB sampler is allowed to equilibrate with the surrounding groundwater for 2 weeks. During this time, VOCs diffuse into the distilled water. The PDB sampler is then removed from the well, and water is transferred into three pre-preserved 40 mL volatile organic analysis (VOA) vials.

Five PDB samplers were placed in monitoring well D-19 on September 15, 2005. One sampler each was placed at depths of 148, 158, and 168 bgs for the purpose of obtaining primary samples. Two additional samplers for quality control samples were placed at148 ft bgs. The PDB samplers were retrieved from well D-19 and sampled on October 4, 2005. The five groundwater samples were assigned sample identifiers D-19FD001, D-19FR001, D-19GW001, D-19GW002, and D-19GW003.

After the sample containers were filled, they were placed into an ice-chilled cooler and shipped overnight to STL, a State of Utah and USACE-certified analytical laboratory, for VOC analysis. Chain-of-custody forms were filled out and used to document the sampling dates, analytical parameters requested, and proper sample handling. Completed chain-of-custody forms and cooler receipt forms are included in Appendix F.

6.2 GROUNDWATER ANALYTICAL RESULTS

Analyses for VOCs were completed using US Environmental Protection Agency (USEPA) Method 8260B. Three VOC analytes were detected in samples from this well. TCE was detected above 5 µg/L from all three sample depths, indicating that the margin of the NEB TCE Plume (as defined by the 5 µg/L TCE isoconcentration contour) lies downgradient (to the north) of monitoring well D-19. A very slight increase in TCE concentrations is observed from the shallowest to the deepest depth from well D-19 samples that were collected, but it may not be statistically significant or reproducible. As per the other nearby D-series wells, low concentrations of carbon tetrachloride (CTC) and chloroform were also detected at the three sample depths. Analytical results for the field duplicate sample taken at 148 ft bgs are comparable to those for the primary sample taken at that depth.

TABLE 1

SUMMARY OF LABORATORY RESULTS

TOOELE ARMY DEPOT, UTAH

Analyte	Federal MCL (µg/L) 95 40CFR 141.11, 141.12, 141.61, & 141.62	Analytical Results (µg/L)			
Sample Number & Depth		D-19GW001 (148 ft)	D-19FD001	D-19GW002 (158 ft)	D-19GW003 (168 ft)
1,1,1 Trichloroethane	200	ND	ND	ND	ND
1,1,2 Thrichloroethane	5	ND	ND	ND	ND
1,1 Dichloroethane	5	ND	ND	ND	ND
1,1 Dichloroethene		ND	ND	ND	ND
1,2 Dichloroethane	5	ND	ND	ND	ND
1,2 Dichloropropane	5	ND	ND	ND	ND
Benzene	5	ND	ND	ND	ND
Carbon tetrachloride	5	0.57J	0.66J	0.76J	0.73J
Chloroethane		ND	ND	ND	ND
Chloroform	100	0.25J	0.22J	0.20J	0.23J
cis 1,2 Dichloroethene		ND	ND	ND	ND
Ethylbenzene	700	ND	ND	ND	ND
m,p Xylene	10,000	ND	ND	ND	ND
Methylene chloride	3	ND	ND	ND	ND
Naphthalene		ND	ND	ND	ND
o Xylene	10,000	ND	ND	ND	ND
Tetrachloroethene		ND	ND	ND	ND
Toluene	1,000	ND	ND	ND	ND
trans 1,2 Dichloroethene		ND	ND	ND	ND
Trichloroethene	5	6.0	5.9	6.3	6.6
Vinyl chloride	2	ND	ND	ND	ND

J = Estimated Result. Result is less than reporting limit.

7. INSTALLATION RESTORATION WASTE

7.1 DECONTAMINATION METHODS

To help minimize the chance that non-dedicated equipment could cross-contaminate groundwater or sediment at well D-19, a rigorous decontamination program was followed. A decontamination station was constructed in the temporary UID RCRA 90-day yard (located south of Building 614) that could accommodate the drill rig, drill pipe, and other equipment as needed. Decontamination of equipment was conducted with approved water from TEAD production well WW-3 using a steam cleaner/high-pressure washer. Equipment wash and rinse water was contained in a sump within the decontamination pad, and pumped to a Baker Tank (Parsons container #PARSNZ0518101) that was labeled as hazardous waste. This tank was located within the UID 90-day yard. The wastewater was held in the tank for later disposal pending characterization of the liquid waste stream.

7.2 DISPOSAL OF DRILL CUTTINGS

Drill cuttings in the unsaturated zone were collected below the cyclone in a wheelbarrow and spread evenly on the ground around the well site. Once groundwater was encountered, saturated cuttings and any free groundwater were containerized in 55-gallon drums and transported to the UID 90-day yard via Uniform Hazardous Waste Manifest P5009 by MP Environmental Services. A saturated sample was collected every 5 ft during drilling and, upon completion of the borehole, these samples were composited to a single sample and submitted for laboratory analysis for VOCs. Laboratory results indicated VOCs were not detected in the cuttings from well D-19. Following TEAD approval, the cuttings were returned to the site of D-19 and spread evenly on the ground surface. A copy of the laboratory results is included in Appendix G.

7.3 DISPOSAL OF WASTEWATER

Water derived from the development of well D-19 was transported on July 21, 2005 from the well site to the UID temporary 90-day yard via Uniform Hazardous Waste Manifest P5012 by MP Environmental Services, utilizing a 5,000 gallon capacity tanker truck, and then pumped into a 6,500 gallon capacity Baker Tank (Parsons container # PARSNZ0518101).

This waste stream was added to drilling, development, and equipment rinse water derived from nearby wells D-17 and D-18. Commingling of the waste streams from these wells was justified because these three D-series wells lie on the perimeter of the NEB Plume. Consequently, for IRW management purposes, it was assumed the development water from these wells would be impacted by low-level chlorinated solvents and have similar waste characteristics.

Following the addition of the D-19 development water to the Baker Tank (Parsons container #PARSNZ0518101) it was closed and sampled to determine the most suitable disposal option for this waste stream. Sample IDW57 contained 0.41 µg/L TCE, 0.18 µg/L chloroform, and 0.35 µg/L CTC. The waste was coded as F001 and F002 hazardous. Based on this analysis, the water met the requirements for processing at the TEAD GWTP, and this disposal option was recommended to TEAD. A copy of the disposal memo is included in Appendix H. Following authorization by TEAD the waste was transferred to the TEAD groundwater treatment plant on September 18, 2005, via a 5,000-gallon capacity tanker provided by MP Environmental.

8. REFERENCES

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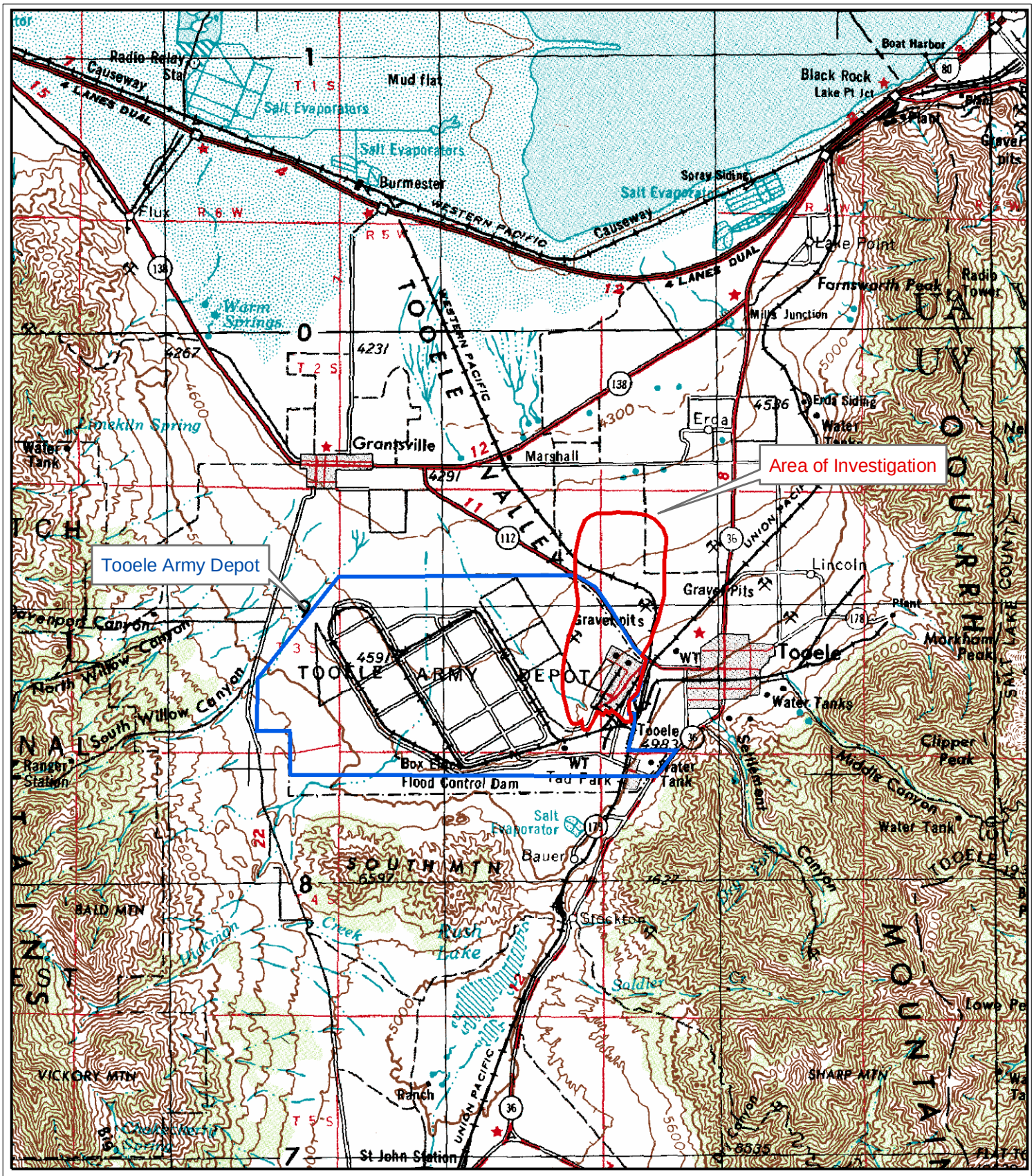
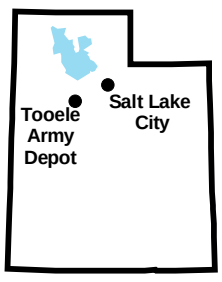
Welenco. 1996. Water and Environmental geophysical Well Logs: Volume 1—Technical Information and Data, 8th edition.



LEGEND

- Installation Boundary
- Investigation Boundary

Source: USGS Tooele, Utah 1 x 2 Quadrangle, 1970



SWMU 58
PHASE II RFI
TOOELE ARMY DEPOT
TOOELE, UTAH

0 1 2 3 Miles

N

FIGURE 1.1
SITE LOCATION MAP

w:\tooele\maps\well_comp_report_sept2005\Loc_Map.mxd 11/28/05

PARSONS

APPENDIX A

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

PROJECT: Tooele Army Depot
Groundwater Monitoring Wells

LAND LEASE

BETWEEN

PERRY/TOOELE ASSOCIATES, LLC

AND

THE UNITED STATES OF AMERICA

THIS LEASE, made and entered into this 28th day of April, 2005, by and between Perry/Tooele Associates, Limited Partners, whose address is 416 W. 2000 North, Tooele, Utah 84074 and whose interest in the property hereinafter described is that of owner for its heirs, executors, administrators, successors, and assigns, hereinafter called Lessor, and THE UNITED STATES OF AMERICA, hereinafter called the Government:

WHEREAS, Tooele Army Depot was placed on the Environmental Protection Administration's (EPA) National Priorities List in October 1990. Several known and potential waste sites on the installation were designated as sites for environmental study and possible cleanup under Comprehensive Environmental Response, Compensation & Liability Act, in accordance with a 1991 agreement between the Army, the EPA, and the Utah Department of Environmental Quality.

WHEREAS, the Government approached the Lessor for a Right of Entry for the construction and access to groundwater monitoring well, and the Lessor agreed by accepting the Right of Entry on December 12, 2000.

WHEREAS, the Government installed a groundwater monitoring well located on Parcel #3-10-2 (Well #D-8) in December 2000 and by request from the Lessor to decommission the well, the Government abandoned Well #D-8 in February 2003.

4-28-05

WHEREAS, the Government is proposing to lease certain property until final placement of three wells on the Lessor's property is determined and all appropriate information is acquired to make formal offer to purchase easements for all three new well sites.

NOW THEREFORE, the Lessor hereby leases to the Government the following described premises, portions of Parcels #3-10-2 (Well #D-17) and #2-138-2 (Wells #D-18 & #D-19), as shown in Exhibit "A" attached hereto and made a part hereof (hereinafter the Property), to be used for the construction of three groundwater monitoring wells and for monitoring and sampling the groundwater for contaminants.

TO HAVE AND TO HOLD the Property for the term beginning November 1, 2004 through October 31, 2005, provided that unless and until the Government shall give notice of termination in accordance with provision 5 hereof, this Lease shall remain in force thereafter from year to year without further notice; provided further that adequate appropriations are available from year to year for the payment of rentals; and provided further that this Lease shall in no event extend beyond October 31, 2007.

1. Compensation:

a. For use of the Parcel #3-10-2 (Well #D-8) from December 15, 2000 to February 27, 2003, a lump sum of $3,348.43 ($2,904.16 and interest of $444.27). The sum will be paid upon execution of this Lease.

b. Beginning upon execution of this Lease, annual rent of $2,550.00 will be paid in arrears at the rate of $850.00 per annum, per well. Payment shall be made at the end of each fiscal year (30 September), by the U.S. Army Corps of Engineers, Finance and Accounting Office, Special Disbursing Agent, 1325 J Street, Sacramento, California 95814-2922.

c. All compensation paid under this Lease will be credited towards the Government's payment for the compensation agreed upon for the price of the easement.

2. The Government and the Lessor agree to enter into discussions on placement of the three new well sites located on Parcels #3-10-2 (Well #D-17) and #2-138-2 (Wells #D-18 & D-19) as required by the State of Utah. As part of these discussions, the Lessor shall allow the Government and its contractors access to the Property and upon agreement of the sites, this Lease will be amended by Supplemental Agreement to allow for construction of the wells. The Government further agrees upon construction of the wells, it will make an offer to buy a 30-year easement for all three groundwater well sites, prior to the termination of this Lease. Upon execution of an easement, this Lease will terminate.

DMS 4-28-05

3. The Government shall have the right, during the existence of this Lease to attach fixtures, and erect structures or signs, in or upon the Property, which fixtures and structures, or signs so placed in, upon or attached to the Property shall be and remain the property of the Government and may be removed or otherwise disposed of by the Government.

4. The Government has the right of ingress/egress in, on, over, and across said Property for the use by the Government, its representatives, agents, and contractors.

5. The Government may terminate this Lease at any time by giving thirty (30) days notice in writing to the Lessor, and no rental shall accrue after the effective date of termination.

6. Any notice under the terms of this Lease shall be in writing signed by a duly authorized representative of the party giving such notice, and if given by the Government shall be addressed to the Lessor at 416 West 2000 North, Tooele, Utah 84074, and if given by the Lessor, shall be addressed to U.S. Army Corps of Engineers, Real Estate Division, 1325 J Street, Sacramento, California 95814-2922.

7. The Lessor warrants that no person or selling agency has been employed or retained to solicit or secure this Lease upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Lessor for the purpose of securing business. For breach or violation of this warranty the Government shall have the right to annul this Lease without liability or in its discretion to deduct from the Lease price or consideration the full amount of such commission, percentage, brokerage, or contingent fee.

8. No Member of or Delegate to Congress or Resident Commissioner shall be admitted to any share or part of this Lease or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Lease if made with a corporation for its general benefit.

9.a. The Government may, by written notice to the Lessor, terminate the right of the Lessor to proceed under this Lease if it is found, after notice and hearing, by the Secretary of the Army or his duly authorized representative, that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Lessor, or any agent or representative of the Lessor, to any officer or employee of the Government with a view toward securing a lease or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing, of such lease; provided, that the existence of facts upon which the Secretary of the Army or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

b. In the event this Lease is terminated as provided in paragraph 9.a hereof, the Government shall be entitled (i) to pursue the same remedies against the Lessor as it could pursue in

4-28-05

the event of a breach of the Lease by the Lessor, and (ii) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Secretary of the Army or his duly authorized representative) which shall be not less than three nor more than ten times the costs incurred by the Lessor in providing any such gratuities to any such officer or employee.

c. The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Lease.

10. The Lessor agrees that the Comptroller General of the United States or any duly authorized representatives shall, until the expiration of three (3) years after final payment of the agreed rental, have access to and the right to examine any directly pertinent books, documents, papers and records of the Lessor involving transactions related to this Lease.

11. If any action of the Government's employees or agents in the exercise of this Lease results in damage to the real property, the Government will, in its sole discretion, either repair such damage or make an appropriate settlement with the Lessor. In no event shall such repair or settlement exceed the fair market value of the fee title to the real property at the time immediately preceding such damage. The Government's liability under this clause is subject to the availability of appropriations for such payment, and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet any deficiencies. The provisions of this clause are without prejudice to any rights the Lessor may have to make a claim under applicable laws for any damages other than those provided for herein.

{Signatures to follow.}

DNB
4-28-05

IN WITNESS WHEREOF, the parties hereto have hereunto subscribed their names as of the date first above written.

WITNESS MY HAND this 28th day of April 2005.

PERRY/TOOELE ASSOCIATES, LLC.

Signature: _____

Print Name: DREW D. HALL

ACCEPTED

THE UNITED STATES OF AMERICA

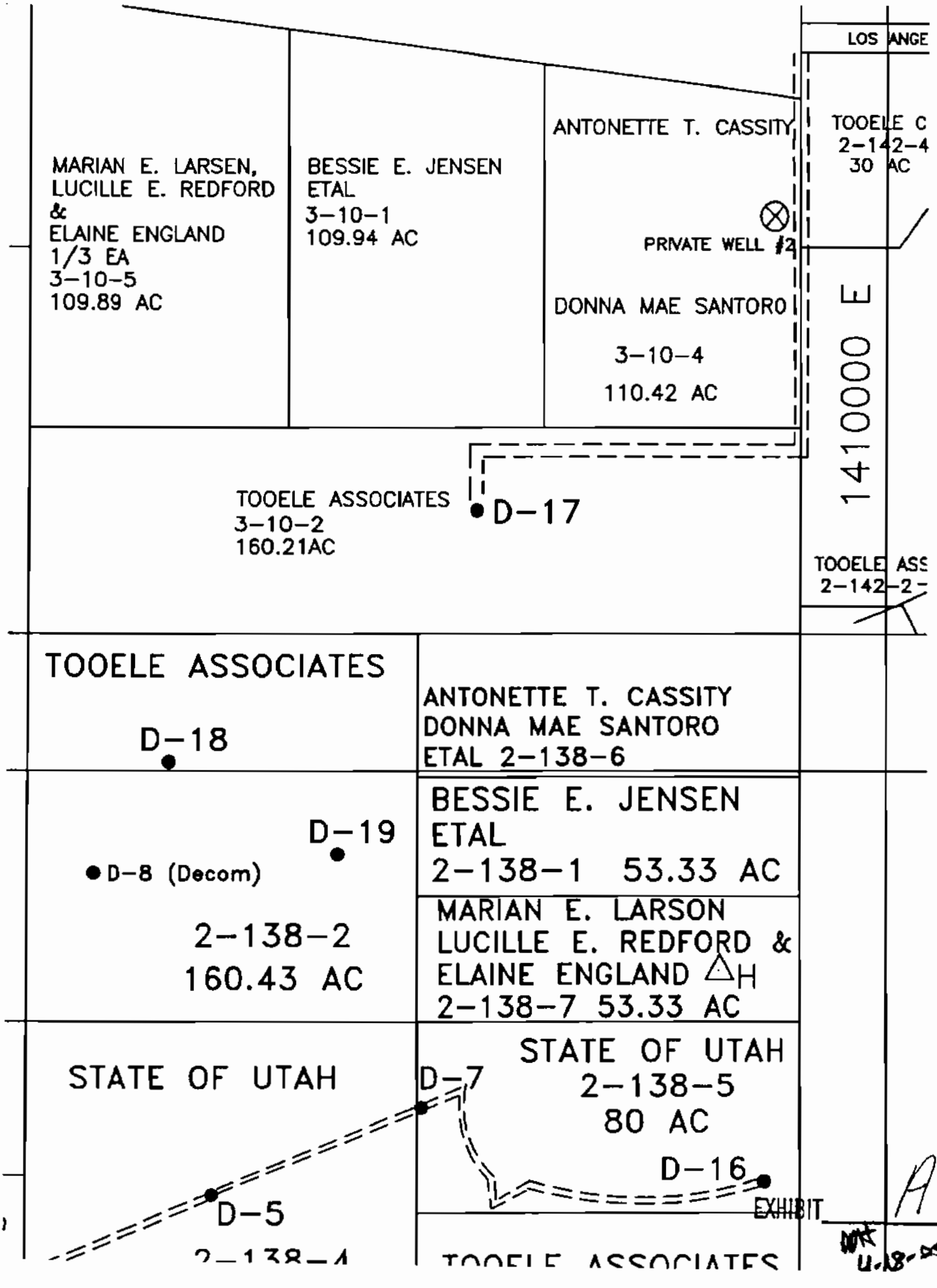
By: _____ For

MARVIN D. FISHER
Chief, Real Estate Division
U.S. Army Engineer District, Sacramento

DDH 4-28-05

REVIEWED AS TO FORM AND CONTENT:

_____
ATTORNEY


LOS ANGE
MARIAN E. LARSEN,
LUCILLE E. REDFORD
&
ELAINE ENGLAND
1/3 EA
3-10-5
109.89 AC
BESSIE E. JENSEN
ETAL
3-10-1
109.94 AC
ANTONETTE T. CASSITY
PRIVATE WELL #2
DONNA MAE SANTORO
3-10-4
110.42 AC
TOOELE C
2-142-4
30 AC
1410000 E
TOOELE ASSOCIATES
3-10-2
160.21AC
D-17
TOOELE ASS
2-142-2
TOOELE ASSOCIATES
D-18
ANTONETTE T. CASSITY
DONNA MAE SANTORO
ETAL 2-138-6
D-19
D-8 (Decom)
2-138-2
160.43 AC
BESSIE E. JENSEN
ETAL
2-138-1 53.33 AC
MARIAN E. LARSON
LUCILLE E. REDFORD &
ELAINE ENGLAND
2-138-7 53.33 AC
H
STATE OF UTAH
D-7
STATE OF UTAH
2-138-5
80 AC
D-16
D-5
EXHIBIT
A
TOOELE ASSOCIATES

PARSONS

406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069 • www.parsons.com

June 2, 2005

State of Utah
Department of Natural Resources
Division of Water Rights
1594 West North Temple
Suite 220
P.O. Box 146300
Salt Lake City, Utah
84114-6300

Attn: Ross Hanson

Subject: Request for authorization to drill groundwater monitoring wells for the Phase II RCRA Facilities Investigation at Tooele Army Depot

Dear Sir:

Parsons, on behalf of Tooele Army Depot (TEAD), requests authorization from the Division of Water Rights (DWR) to drill and install three (3) groundwater monitoring wells in Tooele Valley northeast of TEAD and west of Tooele City (see attached table and map figure). Preparations are in progress to drill these wells starting on or after June 20th and finishing by mid-July, 2005.

All well borings will be advanced by a State of Utah licensed well driller using percussion hammer drilling to a maximum depth of about 210 ft. As per other D-series monitoring wells constructed during this program, wells will be constructed using four (4) inch diameter Schedule 40 PVC, each well will extend approximately 40 ft below the regional water table, and a 20-ft 10- or 20-slot PVC well screen will be installed over the bottom 20 ft.

If you have any questions or concerns please contact me at (801) 572-5999.

Written authorization should be mailed to Larry McFarland, SJMTE-CS-EO, 1 Tooele Army Depot (Building 8), Tooele, Utah 84074. His work phone is (435) 833-3235.

Sincerely,

Richard Jirik

Richard Jirik, R.G., P.G.
Senior Hydrogeologist
Parsons

LOCATION DATA FOR PROPOSED GROUNDWATER MONITORING WELLS D-17, D-18, AND D-19
NORTHEAST BOUNDARY AREA
PHASE II RFI @ SWMU 58, TOOELE ARMY DEPOT

	-proposed well location-		-referenced section corner-		-well location relative to								
Well Identifier	State Plane (northing)	State Plane (easting)	State Plane (northing)	State Plane (easting)	North/South Distance (feet)	East/West Distance (feet)	Section Corner	Section	Township	Range	Base	Diameter (inches)	Est Depth (feet)
D-17	7381795	1407267	7380941	1409417	North 854	West 2150	SE	6	3S	4W	SL	4	170
D-18	7380824	1404691	7380941	1404137	South 117	East 554	NW	7	3S	4W	SL	4	180
D-19	7379877	1406331	7380941	1404137	South 1064	East 2194	NW	7	3S	4W	SL	4	200

The state plane coordinates provided in this table for the proposed monitoring wells were derived from staked locations in the field. Coordinates were provided by Ward Engineering of SLC.

DIVISION OF WATER RIGHTS
REQUEST FOR NON-PRODUCTION WELL CONSTRUCTION
(for wells deeper than 30 feet)

Well Type (check one): Provisional ( ) Monitor (X) Cathodic Protection ( ) Heat Exchange ( )

Applicants Name: TOOELE ARMY DEPOT

Mailing Address: SJMTE-CS-EO 1 TOOELE ARMY DEPOT (BLDG 8)

TOOELE UTAH 84074

Contact Person: MR. LARRY McFARLAND Phone: (435) 833-3504

Proposed Start Date: 6/22/05 Anticipated Completion Date: 7/25/05

Well Drillers License No: 626 Proposed No. of Wells: 3

PROPOSED LOCATION OF WELLS:

County: TOOELE

NO./SQ. DISTANCE (feet)	EAST/WEST DISTANCE (feet)	SECTION CORNER	SECTION	TOWNSHIP	RANGE	BASE	DIAMETER (inches)	DEPTH (feet)
N1000	W1300	W4	15	2S	1W	SL	2	100

Use back of form or additional paper if more room is needed

EXPLANATORY: REFER TO ACCOMPANYING TABLE FOR INFORMATION ON PROPOSED WELLS LOCATIONS SHOWN ON ENCLOSED FIGURE. ALL WELLS LOCATED OUTSIDE OF THE NORTHEAST BOUNDARY TCE PLUME, AND WILL SERVE IN A SENTINEL CAPACITY.

Richard Sirk (PARSONS) FOR
Signature of Applicant LARRY McFARLAND (TOOELE ARMY DEPOT)

JUNE 2, 2005
Date

FOR OFFICE USE ONLY

Date of Request: _____ *Approval Date:* _____

Approved by: _____ *Provisional/Monitor Well No.* _____

Water Right Number (if available): _____

cf: File (Restoration) IAT 6/9
Larry McFarland

State of Utah
DEPARTMENT OF NATURAL RESOURCES
Division of Water Rights

JON M. HUNTSMAN, JR.
Governor
GARY R. HERBERT
Lieutenant Governor

MICHAEL R. STYLER
Executive Director

JERRY D. OLDS
State Engineer/Division Director

TOOELE ARMY DEPOT
SJMTE-CS-EO
1 TOOELE ARMY DEPOT BLDG 8
TOOELE, UT 84074

June 7, 2005

Dear Applicant:

RE: MONITOR WELL#: 0515003M00

Reference is made to your request to drill 3 MONITOR WELL(S). The anticipated drilling depths will exceed the minumum regulated and reporting depth of 30 feet, thereby requiring permission from the Division of Water Rights to proceed with this project.

The specifications outlined in your well project request dated June 7, 2005. meet the State Engineer's requirements and permission is **HEREBY GRANTED.** Therefore, this letter is your authorization to proceed with the construction of the well(s) in accordance with those specifications and with respect to the following provisions:

1) Small diameter casing is to be used in the construction of the well(s) and no more water is to be diverted than is necessary to determine the quality of the ground water by obtaining representative samples as required by the project.

2) The well(s) must be drilled by a currently licensed Utah driller and must be drilled in a manner consistent with the recommended construction standards cited in the Utah State Administrative Rules for Well Drillers.

3) The enclosed Driller (START) Card form must be given to the licensed driller for his submittal prior to commencing well construction. The other enclosed form is the 'Applicant Card.' It is **YOUR RESPONSIBILITY** to sign and return this Applicant Card form to our office upon well completion.

4) If complete information is not available in the initial application, it is the **APPLICANT'S RESPONSIBILITY** to provide, upon completion, descriptive locations of the wells referenced by course and distance from established section corners, *e.g. North 565 feet and West 1096 feet from the SE corner of Section 35, T2S, R5W, SLB&M.*

5) At such time as the well(s) are no longer utilized to monitor ground water and the intent of the project is terminated, the well(s) must be temporarily or permanently abandoned in a manner consistent with the Administrative Rules.

NOTE: Please be aware that your permission to proceed with the drilling under this authorization expires December 6, 2005.

Sincerely,

Ross Hansen, P.E.
Regional Engineer

1594 West North Temple, Suite 220, PO Box 146300, Salt Lake City, UT 84114-6300
telephone (801) 538-7240 • facsimile (801) 538-7467 • *www.waterrights.utah.gov*

APPLICANT CARD for Monitor WELL#: 0515003M00

IMPORTANT: THIS CARD MUST BE COMPLETED, SIGNED AND RETURNED BY THE WELL OWNER/APPLICANT AS SOON AS THE WELL IS DRILLED BY A LICENSED UTAH WATER WELL DRILLER.

OWNER/APPLICANT NAME: TOOELE ARMY DEPOT

MAILING ADDRESS: SJMTE-CS-EC, 1 TOOELE ARMY DEPOT BLDG 8, TOOELE, UT 84074

PHONE NUMBER: 435-833-3504

WELL LOCATION: You are authorized to drill 3 Monitor Wells, SEE BELOW.

WELL UTM COORDINATES:

WELL ACTIVITY: NEW (X) REPAIR ( ) REPLACE ( ) ABANDON ( )
CLEAN ( ) DEEPEN ( )

WELL COMPLETION DATE:

NAME OF DRILLING COMPANY/LICENSEE:

Larry McFarland 6-13-04

Owner/Applicant Signature Date

***COMPLETE, SIGN AND RETURN THIS PORTION UPON FINAL WELL COMPLETION - DO NOT GIVE THIS CARD TO LICENSED WELL DRILLER - YOU MUST RETURN IT.

STATE OF UTAH DIVISION OF WATER RIGHTS Phone No. 801-538-7416
Fax No. 801-538-7467

COMMENTS:

MONITOR WELL LOCATIONS:
(1) N 854 W 2150 from the SE corner, S06 T 3S R 4W SLBM
(2) S 117 E 554 from the NW corner, S07 T 3S R 4W SLBM
(3) S 1064 E 2194 from the NW corner, S07 T 3S R 4W SLBM

START/APPLICANT CARD INSTRUCTIONS: First, for each well, you must give a Driller (Start) Card to the licensed driller with whom you contract to construct the well. Second, it is your responsibility to sign and return this Applicant Card to this office immediately after completion of the well. **CAUTION: There may be local health requirements for the actual siting of your well. Please check with the proper local authority before construction begins. See the enclosed sheet addressing construction information.**

DRILLER (START) CARD for Monitor WELL#: 0515003M00

IMPORTANT: THIS CARD MUST BE RECEIVED BY THE DIVISION OF WATER RIGHTS PRIOR TO THE BEGINNING OF WELL CONSTRUCTION -- REQUIRED ONLY FOR WELLS DEEPER THAN 30 FT.

OWNER/APPLICANT NAME: TOOELE ARMY DEPOT
MAILING ADDRESS: SJMTE-CS-EQ, 1 TOOELE ARMY DEPOT BLDG 8, TOOELE, UT 84074
PHONE NUMBER: 435-833-3504
WELL LOCATION: You are authorized to drill 3 Monitor Wells. SEE BELOW.
WELL UTM COORDINATES:
WELL ACTIVITY: NEW (X) REPAIR ( ) REPLACE ( ) ABANDON ( )
CLEAN ( ) DEEPEN ( )

For surface seals in unconsolidated formations (clay, silt, sand, and gravel), will you be using a temporary conductor casing or other formation stabilizer (e.g., drilling mud) in the surface seal interval to maintain the required annular space?

(YES) or NO (Circle one).

Answering 'NO' suggests that you will be placing the surface seal in an open and unstabilized annular space, which may require onsite inspection of seal placement by the State Engineer's Office.

PROPOSED START DATE: 6-27-05

PROJECTED COMPLETION DATE: 7-27-05

LICENSE #: 626 LICENSEE/COMPANY: Layne Christensen Co.

[signature] 6-22-05

Licensee Signature Date

D-17
D-18
D-19

NOTICE TO APPLICANT: THIS CARD IS TO BE GIVEN TO A UTAH LICENSED WATER WELL DRILLER FOR SUBMITTAL TO THE DIVISION OF WATER RIGHTS PRIOR TO WELL CONSTRUCTION.
STATE OF UTAH DIVISION OF WATER RIGHTS Phone No. 801-538-7416
Fax No. 801-538-7467

MONITOR WELL LOCATIONS:
(1) N 854 W 2150 from the SE corner, S06 T 3S R 4W SLBM
(2) S 117 E 554 from the NW corner, S07 T 3S R 4W SLBM
(3) S 1064 E 2194 from the NW corner, S07 T 3S R 4W SLBM

WELL DRILLER'S REPORT
State of Utah
Division of Water Rights

For additional space, use "Additional Well Data Form" and attach

Well Identification

Non-Production Well: 0515003M00 WIN: 34328

Owner *Note any changes*

TOOELE ARMY DEPOT
SJMTE-CS-EO
1 TOOELE ARMY DEPOT BLDG 8
TOOELE, UT 84074

Contact Person/Engineer: Richard Jirik / Parsons

Well Location *Note any changes*

S 1064 E 2194 from the NW corner of section 07, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation, local well #) D-19

Drillers Activity Start Date: June 27, 2005 Completion Date: September 23, 2005

Check all that apply: ☒ New ☐ Repair ☐ Deepen ☐ Clean ☐ Replace ☐ Public Nature of Use: Monitor Well

If a replacement well, provide location of new well. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	170	9	Percussion Hammer	Air

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABILITY High	PERMEABILITY Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, ordor, fracturing, mineralogy, texture, degree of weathering, hardness, water quality, etc.)
0	148								XX					
148	168	X							XX					

Static Water Level

Date July 13, 2005 Water Level 148 feet Flowing? ☐ Yes ☒ No

Method of Water Level Measurement WLI If Flowing, Capped Pressure N/A PSI

Point to Which Water Level Measurement was Referenced Ground Level Elevation N/A

Height of Water Level reference point above ground surface N/A feet Temperature N/A degrees ☐ C ☐ F

Construction Information

DEPTH (feet) FROM	TO	CASING: CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	TO	☑SCREEN ☐PERFORATIONS ☐OPEN BOTTOM: SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
0	148	4" sch. 40 PVC	40	4	148	168	.010	4	Factory Sl

Well Head Configuration: Above Grade Access Port Provided? ☒Yes ☐No

Casing Joint Type: Flush Thread Perforator Used: N/A

Was a Surface Seal Installed? ☒Yes ☐No Depth of Surface Seal: 145 feet Drive Shoe? ☒Yes ☐No

Surface Seal Material Placement Method: Tremie Bentonite Pellets and Bentonite Grout

Was a temporary surface casing used? ☒Yes ☐No If yes, depth of casing: 170 feet diameter: 9 inches

DEPTH (feet) FROM	TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION: SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0	141	Bentonite Grout	29 Bags	50 lbs each
141	145	Bentonite Pellets	2 Buckets	50 lbs each
145	170	16 - 40 Silica Sand	18 Bags	50 lbs each

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GPM	CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
	N/A					

Pump (Permanent)

Pump Description: N/A Horsepower: Pump Intake Depth: feet

Approximate Maximum Pumping Rate: Well Disinfected upon Completion? ☐Yes ☐No

Comments Description of construction activity, additional materials used, problems encountered, extraordinary circumstances, abandonment procedures. *Use additional well data form for more space.*

Well Driller Statement This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name LAYNE CHRISTENSEN COMPANY (Person, Firm, or Corporation - Please Type) License No. 626

Signature (Licensed Well Driller) Date September 28, 2005

APPENDIX B

7/12/05 WEDNESDAY clear 80-105° no wind

7:05 I arrive at D-19. Crew has moved rig to site and is fueling and lubing

7:20 I do rig inspection

7:40 We have Health & Safety tailgate. Topic: Fire Hazard

8:02 Began drilling D-19

8:30 @ 20 ft a plug of clay in head
Richard calls. Violia will be developing D-17 today

10:35 @ 100 ft Tom lifts head too high and snaps cable

11:20 We go to Tooele to meet Christian w/parts

12:25 We head back to D-19 with Christian. He needs to see for himself

12:50 Crew drills down to 107 so they can work on head at ground level

13:10 Crew heads to SLC for new cable. I go to field office to consult with Richard & Kurt

14:05 On my way back to D-17 where Jeff Hammann (Violia) is developing well a fire breaks out at Evpa Lane residence back field. Winds are S-SW. Fire is moving fast

14:30 I watch fore advance south. Tom is back and is moving trailer away from D-18
Ed Stays and Mary Ellen Mckenzie both are in Tooele today and both call to see our proximity to the blaze.

15:50 Fire is almost out. Crew continues to work on rig

16:40 Rig repaired. Continue drilling at 107. I check water level Hole is dry

17:10 @ 130 I take w.l. Hole is dry

17:29 @ 140 we see first water. Shut down for the day - will set up secondary containment in AM

17:45 Crew moves ground trailer into position. Water level = 127.60

18:10 All hands offsite

Matt Lowry 7/13/05

7/14/05 Thursday clear 85-105° No wind

6:30 I arrive at TEAD Field office and pick up Haz Waste Manifest for drum movement later today

7:03 I arrive at D-17

7:38 Crew arrives. They had to go to 90-Day to pick up Drums & drum truck (Tom Kern + Jake Smith)

7:50 We do rig inspection and have H&S tailgate Topic: Cobbles are hazards on ground around site

8:10 Crew sets up secondary containment. I table Drums. and check PID calibration (103.4 on 100 isobut

8:25 Tom lifts head off pipe. I take water level = 127.25

8:32 Begin drilling @ 140'

8:54 @ 154 1st drum full PARSN205 19501

9:15 @ 165 2ND " " " 02

9:27 @ 170 3RD " " " 07 water level = 124.70

We are now 42.3 feet below water surface so I consult with Carl & Richard. We will construct well here

11:10 We have pumped and shoveled out 2ND ary containment take into Drums 04, 05 and 06 We take drum truck to sheep lane gate where MP Environ will pick up today at 15:00 and transport to 90-Day yard

11:25 We drive to the 90-Day and pump free water off the top of the soil in Drums from D-18 into Baker Tank. I put IDW samples in coolers for Kurt

12:10 We drive to Water Well 3 and fill up water trailor for grouting, decon and fire supression.

12:50 We arrive back at D-17 and crew begins to lower well casing down hole. 2-10' sections of schedule 40 4" diameter PVC .010 slot screen ~~followed~~ with a 4" end cap followed by 15-10' schedule 40 4" blank PVC casing

13:05 Jeff Hanmann stops by. He has finished developing D-17 Good well-cleaned up fast

13:25 Crew begins adding 50lb bags of 16-40 colorado silica by pouring from the surface Screen is 168-148 Borehole is 169. Top of sand will be 145. 169-145 = 24ft as per page 48 Borehole ~~water~~ volume = 0.44 ft^3/ft from 169 to 168

7/14/05 (cont)
From 168 to 145 annulus volume = 0.35 ft^3/ft (p. 48)
23 ft x 0.35 ft^3/ft = 8.05 ft^3 + 0.44 ft^3 = 8.49 ft^3
One bag = 0.5 ft^3 ∴ 8.49/0.5 = 17 bags

14:45 Crew has added 18 bags and top of sand is at 150.4. Hole must be wallowed out some. We are scheduled to meet MP to manifest the drums at this time. so we will return to finish well construction

15:10 MP driver arrives and we load 6 drums on truck

15:15 Dean Reynolds and Larry Mcfarland arrive Larry signs Manifest #P5009 as the generator Driver takes and signs manifest and placards truck for transport. Kurt is also moving tankard of water from D-17 development at this time, and passes by us on his way to 90-Day.

15:40 We arrive at 90 Day. Dean signs manifest as facility operator and we unload drums and empty tankard into Baker tank Larry asks we also pump residual decon water from D-18 decon into Baker tank from sump of decon pad. Dean observes one drum labled 9/26/05 instead of 6/29/05 and has me correct the error. Kurt leaves site for meeting in SLC @ 17:00

16:40 Tom and Jake return to D-19. I wait for tanker to be emptied

17:05 Tanker empty. I head to D-19.

17:15 Once returned Tom had tagged top of sand at 144.4 indicating a good deal had settled out of water while we were gone and it was slightly locked inside casing. He was able to tap a few times with the hammer and have it fall out. Final top of sand is 145.2 bgs Crew then added 2-5 gallon buckets of Cetco coated bentonite pellets which brought top of seal to 139.9. Crew must

7/14/05
pull pipe up a bit so pelets don't hydrate inside casing overnight and lock well. We pull pipe to 135.6.
17:55 All hands offside

7/14/05

7/15/05 Friday weather: clear 85-105° no wind

6:40 I arrive at Parsons TEAD Field office and fax start card for Well C-45 to Tim Stiew at Layne so we can begin drilling on next Tues. Tim will forward card to State of Utah

6:55 Tom Kevo calls & says they will be 45 minutes late - getting fuel

7:45 I arrive at D-R. Crew is setting up grout plant I have tom tag hole. For 135.9. A few feet of caving occurred overnight but likely coarse material and slurry will work down to bentonite plug

8:05 We do rig inspection of grout plant and have H & S tailgate. Topic: Heat stress.

8:40 Crew begins grouting from 135.9 to surface 136 ft × 0.35 ft^3/ft = 47.6 ft^3 (for 9" borehole + 4" well annulus as per page 48 of log book) Cetco claims each bag of (50 lbs) grout yields 2.2 ft^3 when mixed with 14 gallon water. This produces grout with 30% solids.

47.6 ft^3 / 2.2 ft^3/bag = 21.6 bags

Crew mixes batches of 2 bag + 28 gallon H_2O using a Wilden Diaphram pump and a 55 gallon drum attached to the pipe truck water tank

11:10 Crew has grouted to ground surface using 24 bags grout. Calculated volume was 21.6 so formation took several bags. Crew heads to de-con pad with pipe truck

13:20 Crew has completed decon & pumped water into baker tank and cleaned drums that Carl Cole was concerned about.

14:05 We complete driller dailys and sign off Crew leaves site. I work on QC of Dailey quality control reports by Erik Sohm.

16:45 I leave site for the day

Matt Lewis 7/15/05

7/18/05 Monday weather: clear 70-90° no wind

7:06 On my way to Parsons TEAD field office I pass Violia development truck on thier way to D-18
7:20 I arrive at field office & update & review Erik Sahm Dailey Quality Control reports
8:40 Erik and Kurt arrive. Kurt says somehow M.P trucking was unaware we needed a tanker at D-18 for violia to dump development water in. Violia has been waiting since 7:30. Kurt arranges for one to meet me at sheep lane gate a.s.ap.
9:10 I head to gate
9:50 MP arrives at gate
10:04 We drop tanker at D-18. I go to D-19 where Tom and Jake are digging for pad and have installed protection
10:15 We have H & S. Topic: Eye hazards with cement
10:30 We do wspection of the auger rig brought out to dig bollard holes. I head back to field office for compass to align pad on North line
10:45 Kurt & Erik are mowing grass at C-45. Kurt gives me a north line for D-19 which I relay to Tom
13:20 Crew comes to field office They are headed to town for food & concrete. I continue with Dailey quality controll reports
16:10 Tom back at field office for a lock and key for D-19. Jacke is back painting casing & bollards
17:05 Crew is leaving site. They will decon rig tomorrow We are meeting Larry McFarland tomorrow at 8:00 at TEAD security for badges and vehicle passes
18:03 I leave TEAD

7/18/05

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 7/13/05

Site: SWMU 58 Arrival Time: 7:05

Team Leader: Richard Jurik Departure Time \Destination: 18:10

Team Members: Matt Ivers, Kurt Alloway Weather: clear 80-105° no wind

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☒ Well Installation D-19
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 7:40 People Present Matt Ivers, Tom Kerns, Jake Smith

Topics Discussed: Fire Hazard

Logbook Book # B071503 Page # 148

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N **Current Location:** **Update DITF?: Y / N**

Notes: 7:05 I arrive at D-19 7:20 Do rig inspection 7:40 H&S tailgate 8:02 begin drilling from surface Violia is Developing D-17 today 10:55 @ 100' head down cable snaps 12:50 Crew drills to 107 so they can work on head 13:10 Crew heads to SLC for cable 14:05 Fire breaks out in field where wells are located 16:40 Rig repaired. Continue drilling from 107. 17:10 @ 130 I take water level—Dry hole 17:29 @ 140 first water 17:45: Water Level = 127.60 Shutdown 18:10 Offsite

- Violia completes bailing and partial pumping of D-17

Attachment 1-2

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 7/14/05

Site: SWMU 58 Arrival Time: 6:30

Team Leader: Richard Jirik Departure Time \Destination: _____

Team Members: Matt Ivers, Kurt Alloway Weather: clear 85-105° no wind

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☒ Well Installation D-19
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☐ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 7:50 People Present Tom Kerns, Jake Smith, MI

Topics Discussed: Cobble slip trip fall hazards

Logbook Book # B071503 Page # 149

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N **Current Location:** **Update DITF?: Y / N**

Notes: 6:30 Arrive at field office & pick up manifest 7:03 Arrive at D-19 7:50 Do insp. section and have H&S tailgate 8:10 Set up secondary containment & table drums. Water level 127.25 8:32 Begin drilling @ 140' 9:27 170'. 42.3' below g.w. table. Stop drilling. 11:10 Cleaned secondary containment into drums 11:25 Pump drums in 90 Day into Baker tank. Put IRW samples in fridge 12:10 Fill up with water at WW3 12:50 @ D-19 lower well casing to 169'. Screen 148-168. 13:05 Violia completes development of D-17. 13:35 Sand annulus from 169 - 150.4 most 90' move drums 15:40 Move drums Parsons 19501 thru 06 to 90-Day. Move tanker with D-17 purge/development water as well. Pump into Baker Tank 17:15 Return to D-19. Pull 10' casing Tag sand @ 145.2'. Add 2-5gallon bucket bentonite pellets. Pull casing to 135.6. Let hydrate overnight 17:55 All hands offsite

Attachment 1-2

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 7/15/05

Site: SWMU 58 Arrival Time: 6:40

Team Leader: Richard Jirik Departure Time \Destination: 16:45

Team Members: Matt Ivers, Kurt Alloway Weather: weather clear 85-105°

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☐ Well Installation D-19
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☐ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 8:05 People Present Tom Kerns, Jake Smith, M.I

Topics Discussed: Heat Stress

Logbook Book # B071503 Page # 152

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N **Current Location:** **Update DITF?: Y / N**

Notes: 6:40 Arrive at Field office - fax std card to C-45 to Tim Stiew 6:55 Tom Kerns is late getting fuel / 7:45 Arrive at D-19 Tom tags top of grout at 135.9 8:05 Daily inspection & H's Stalgat 8:40 Crew begins grouting from 135.9 to Surface 11:10 Crew has grouted to surface with 29 bags grout 13:20 Crew completes decon of pipetruck and pumps sump into Baker tank. 14:05 Crew completes paperwork & leaves site. / work on Darley Quality Control Reports 16:45 / leave site

Attachment 1-2

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 7/18/05

Site: SWMU 58 Arrival Time: 7:06

Team Leader: Richard Jirik Departure Time \Destination: 18:03

Team Members: Matt Ivers, Erik Sahm, K.A. Weather: clear 70-90° no wind

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☐ Well Installation D-19
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 10:15 People Present Tom Kerw, Jake Smith, M. Ivers

Topics Discussed: Eye hazards with concrete

Logbook Book # B071503 Page # 153

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N **Current Location:** **Update DITF?: Y / N**

Notes: 7:06 Pass Stolicas on way to office. They are going to develope D-18
7:20 Arrive at office. Review & update Daily quality control reports for Richard Jirik 8:40 Erik Sahm onsite. 8:55 Kurt onsite. He says M.P failed to arrive at D-18. They are sending a truck ASAP. 9:10 I go to escort MP to site 9:50 MP arrives We drop tanker at D-18 10:04 I go to D-19. Crew has installed protective zone Digging pad. 10:15 We have H&S 10:30 Inspect auger rig 10:45 Kurt and Erik mow grass at C-45 site 16:10 Tom gets key for well D-19. Jake is painting 17:05 Crew is leaving site 18:03 I leave site

HEALTH AND SAFETY BRIEFING D-19

Date: 7 / 13 / 05 Time: 7:15

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. [signature]	11.
2. Tom Ka[illegible]	12.
3. Jacob Lowe[illegible]	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. From this location we are unable to see
2. to the south where fire would likely
3. come from. It is 100°+ with very dry
4. grass so keep your eye out for smoke
5. and I will make regular trips to the
6. crest of the hill to observe
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING D-19

Date: 7/14/05 Time: 7:50

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. [signature]	11.
2. [signature]	12.
3. [signature]	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. Gravel and Cobble on the ground around
2. site can easily cause sever ankle or knee
3. injuries. Remove them from the site when
4. you see them. Always watch your footing.
5.
6.
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING D-19

Date: 7/15/05 Time: 8:05

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. [signature]	11.
2. [signature]	12.
3. [signature]	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. Way too hot!
2. Hyprate regularly all day
3. Take brakes w cab with A.C.
4. Stand w shade whenever possible
5. Shut down if serious symtems occurr
6.
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING D-19

Date: 7 / 18 / 05 Time: 10:15

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. [signature]	11.
2. [signature]	12.
3. [signature]	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. When mixing concrete by hand for surface
2. completions there is a potential hazard of
3. getting concrete in ones eye while toss
4. mixing so always wear safety glasses
5. with side shields The lime can burn and
6. the grit can scratch your cornea easily
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

Layne Christensen Company Job Site Safety Audit

Date 7/13/05 | Site: TEAD - Phase II RFI @ SWMU 58 | Client: USACE

Rig/Crew: Tom Kerr, Jake Smith

Observers: Matt Ivers D-19

Crew Safety/PPE	YES	NO	N/A		YES	NO	N/A
Hard Hat	☑	☐	☐	Safety Glasses	☑	☐	☐
Lifting Belt	☐	☐	☑	Training Certificates	☐	☐	☑
Gloves	☑	☐	☐	Hearing Protection	☑	☐	☐
Safety Shoes	☑	☐	☐	Proper Clothing	☑	☐	☐
Layne Safety Practice Manual	☐	☐	☑	Dust masks/Level C respirators	☑	☐	☐
DOT physical card, CDL and logbooks present and up to date?	☐	☐	☑	Emergency numbers/HASP present and posted?	☑	☐	☐

Comments:

Site Set-up and Safety							
Hole openings covered or tied off?	☐	☐	☑	Timbers and set-up jacks stable?	☑	☐	☐
Anchor guy lines secure, evenly tensioned and flagged?	☐	☐	☑	Mud or circulation pits barricaded or fenced?	☐	☐	☑
Excavation permit (CA) and ~~Shoring~~ considerations?	☑	☐	☐	Traveling blocks, widow makers and elevators inspected?	☐	☐	☑
Site clean and organized? Footing?	☑	☐	☐	Bulk fuel stores lined and grounded?	☐	☐	☑
Pipe blocked and sloped from work area?	☑	☐	☐	Correct monitoring equipment present?	☑	☐	☐
Overhead and underground lines identified?	☑	☐	☐	Chemicals stored away from fuel and protected?	☐	☐	☑
Material Safety Data Sheets present?	☐	☐	☑	Warning signs/Exclusion zone posted?	☐	☐	☑

Comments:

Rig Safety							
Kill switch operational?	☑	☐	☐	All mast wiring in conduits?	☑	☐	☐
Vehicle pretrip inspection performed and documented?	☐	☐	☑	Seat belts available and used on all equipment?	☐	☐	☑
Fire extinguisher present and charged?	☑	☐	☐	First aid/BBP kit present and stocked?	☑	☐	☐
Danger points color coded?	☐	☐	☑	Controls identified?	☑	☐	☐
Side guardrails on platform rigs?	☐	☐	☑	Ropes and chains in good condition?	☑	☐	☐
Belts and rotating shafts guarded?	☑	☐	☐	All hooks have safety latches?	☑	☐	☐
Cables in good shape, clamps installed properly?	☑	☐	☐	Pressure hoses safety chained at connections?	☑	☐	☐
Good housekeeping in vehicle cabs?	☐	☐	☑	Spill control materials present?	☑	☐	☐

Rig Safety (cont'd.)	YES	NO	N/A		YES	NO	N/A
DOT #53175 and inspection stickers present and up to date?	☐	☐	☑	Bill of lading, HAZMAT CDL and placarding for hazardous materials hauled?	☐	☐	☑
Climbing blocks and body harness installed, available and used?	☑	☐	☐	Heaters and engines vented outdoors and extinguished?	☐	☐	☑

Comments:

Tool and Equipment Safety							
Spinning chains have rope tail?	☐	☑	☑	Safety cans used for gasoline storage?	☑	☐	☐
Tools and slings in good condition?	☑	☐	☐	All generators grounded?	☑	☐	☐
Compressed gas bottles secure and upright?	☐	☐	☑	GFI used and electrical cords in good condition?	☐	☐	☑
Tag lines used on hoisted pipe and equipment?	☐	☑	☐	Check valve at torch/hose connection and hoses in good condition?	☐	☐	☑

Comments:

Employee Training							
Employees instructed on safe equipment use?	☑	☐	☐	Heat stress breaks followed and documented?	☑	☐	☐
Knowledgeable of chemicals on site?	☑	☐	☐	First aid/CPR certified?	☑	☐	☐
Documented tailgate safety meeting before start of work?	☑	☐	☐	Applicable training up to date including respirator fit test, MSHA and/or OSHA.	☐	☐	☑

Comments: H&S tailgate topics 7/13/05 Fire Safety 7/16/05 Concrete Hazards
7/14/05 Slip Trip Fall
7/15/05 Heat Hazards

Confined Space Work							
Confined Space Entry Permit complete?	☐	☐	☑	Gas monitor on site?	☑	☐	☐
Ventilation equipment available?	☐	☐	☑	Body harness and safety line present?	☑	☐	☐

Pump Jobs/Well Rehabilitation/Filters and Vaults							
Lockout/Tagout on electrical controls?	☐	☐	☐	Chemical storage area secure?	☐	☐	☐
PPE for chemicals available?	☐	☐	☐	Water available for flushing chemicals?	☐	☐	☐
Cable spool and in safe position?	☐	☐	☐	Explosives stored and secured properly?	☐	☐	☐
Test pump engine drive shaft guarded?	☐	☐	☐				

Comments: Re-inspected 7/14/05 MH Inspect Pipe truck
" 7/15/05 MH Inspect grout plant

Auditor's Signature _____

Driller's Signature Tom Kar

Helper's Signature _____

EQUIPMENT CALIBRATION LOG

Tooele Army Depot

Phase II RFI @ SWMU 58

Eqpt. Type PID	Serial No.	Date	Calibration Time	Calibration Gas	Calibration Gas Lot No.	Calibrated By:	Comments
MWI RAE2000	9296	6/29/05	9:25	100 ppm isobutelyne	82617-117	Matt Ivers	Monitoring well D-17
"	"	7/6/05	7:50	"	"	"	" D-18
"	"	7/14/05	8:10	"	"	"	" D-19
"	"	7/20/05	14:40	"	"	"	" C-45
"	"	7/28/05	10:40	"	"	"	" C-48f
"	"	7/29/05	7:30	"	"	"	" "
"	"	8/1/05	8:30	"	"	"	" "
"	"	8/5/05	8:05	"	"	"	" C-47f
"	"	8/8/05	8:25	"	"	"	" "
"	"	8/9/05	8:38	"	"	"	" "
"	"	9/20/05	8:50	"	"	"	" C-49

APPENDIX C

DRILLING LOG

DIVISION: Sacramento

INSTALLATION: Tooele Army Depot

SHEET 1 OF 5 SHEETS

1. PROJECT: Phase II RFI (SWMU 58)
2. LOCATION (Coordinates or Station): 7379876.47 N 1406330.96 E
3. DRILLING AGENCY: Layne Geoconstruction
4. HOLE NO. (As shown on drawing title and file number): D-19
5. NAME OF DRILLER: Tom Kerv / Jake Smith
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 170'
8. DEPTH DRILLED INTO ROCK: 0
9. TOTAL DEPTH OF HOLE: 170'
10. SIZE AND TYPE OF BIT: 6" ID 9" OD
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: Drill Systems AP1000 Becker Hammer
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 36; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: 130.81 TOC 7/20/05
16. DATE HOLE: STARTED 7/13/05; COMPLETED 7/15/05
17. ELEVATION TOP OF ~~HOLE~~ CASING: 4497.75 ft
18. ~~TOTAL CORE RECOVERY FOR BORING~~ GROUND: 4494.99 ft
19. SIGNATURE OF INSPECTOR: Zulaf Cuevas

TIME (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	RECOVERY (e)	SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
7/13/05 8:02	0		Silty Gravel (GM) 90% gravel, coarse, subrounded, 10% silt grey 5YR6/1, Dry, strong reaction to HCL	☒	1	Because the Becker Hammer Drilling Method allows a maximum clast size of about 6 inches to get to the surface, percentages of boulders, cobbles and gravel are speculative
	2					
	4			☒	2	
	6					
	8					
8:09	10			☒	3	0.7 min/ft
8:22	12					While clasts range from angular to rounded, many angular clast are likely created by the drilling process so as long as some waterworn clasts are observe in samples, bedrock will not be indicated
	14		- Well graded gravel w/sand 70% cobble & gravel, coarse, subrounded, 20% sand, fine to med, 10% silt, non plastic, light olive brown 2.5Y 5/3 Dry, strong reaction to HCL	☒	4	
	16					
	18					
8:30	20		- Gravelly Clay (CL)	☒	5	0.8 min/ft HEAD PLUGS WITH CLAY
9:01	22		- Well Graded Sand w/gravel (SW) 70% sand, med grain 30% gravel, fine to coarse subrounded to subangular Dark grayish brown 2.5Y 4/2 Moist, strong reaction to HCL			Unless otherwize indicated, rock type represented in the cuttings consists of primarily varying percentages of tan to gray quartzite and gray to dark gray limestone and dolomite, with trace amounts of yellow brown sandstone Multicolored volcanics and a white silicate mineral
	24			☒	6	
	26					
	28					
9:08	30					0.7 min/ft

TEAD Phase II RFI 6 SAMPLES

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS
9:14	32				7	
	34		Lean Clay (CL) High plasticity, grayish brown 2.5Y 5/2, moist, weak reaction to HCL			
	36				8	
	38					
9:18	40					0.4 min/ft
9:22					9	
	42					
	44		- Well graded gravel w/sand (GW) 80% cobble & gravel 15% sand 5% fines, angular to subrounded, fine to coarse light gray 10YR 7/1, Dry strong reaction to HCL			
	46				10	
	48					
9:31	50					0.9 min/ft
9:34					11	
	52		- clayey gravel lense			
			- some strong cementation			
	54		- (GW) as above			
	56				12	
	58					
9:45	60					1.1 min/ft
9:51			Lean Clay (CL) High plasticity Dark yellowish brown 10YR 4/6 moist, weak reaction to HCL, trace fine gravel		13	
	62					
	64		- Silty Gravel (GW) 80% cobble + gravel 15% silt, 5% sand non plastic, light brownish gray 10YR 6/2, Dry strong reaction to HCL			
	66				14	
	68					
9:57	70					0.6 min/ft

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS
10:01			Clayey Gravel (GC) 80% gravel 20% clay low to moderate plasticity reddish brown 5YR 5/3 moist to dry, weak reaction to HCL		15	
	72					
	74					
	76		Well graded gravel w/sand (GW) 70% cobbel & gravel 20% sand, 10% silt, gravel fine to coarse, angular to subrounded, gray 10YR 6/1, dry, strong reaction to HCL		16	
	78					
10:09	80					0.8 min/ft
10:13					17	
	82					
	84					
	86		Well Graded Sand w/trace gravel, (SW) slight plasticity, reddish brown 5YR 4/4 moist, weak reaction to HCL, some clay		18	
	88					
10:18	90					
10:22			Lean Clay w/fine gravel (CL) high plasticity ~15% fine gravel, angular to subrounded reddish brown 5YR 4/4 moist weak reaction to HCL		19	0.5 min/ft
	92					
	94					
	96		Silty Gravel w/sand (GW) 70% gravel 15% silt, 15% sand, non plastic gray 10YR 6/1, dry, strong reaction to HCL		20	
	98					1.3 min/ft cable to push head down breaks
10:35	100					
12:50			clayey gravel lense		21	
	102					
	104					
	106				22	
12:56						
14:40	108		Clayey Sand (SC) moderate plasticity reddish brown 5YR 4/4 moist, weak HCL reaction			
14:43	110					0.9 min/ft

PROJECT TEAD Ph II RFI | HOLE NO. D-19

TEAD Phase II RFI @ SWMU 58 | HOLE NO. D-19 | SIGNATURE OF INSPECTOR [signature] | DATE 7/13/05

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	PID Core/H.S	TEMP	VAPOR & REMARKS SAMPLE I.D.
14:46			- clayey sand (SC) as above		23	
	112		Lean Clay (CL) high plasticity, reddish brown 5YR4/4, moist weak HCL reaction			
	114					
	116				24	
	118					
14:55	120		- some cobble & gravel			0.9 min/ft
15:00					25	
	122					
	124		Well graded gravel with sand and silt (GW-GM) 70% cobble & gravel, fine to coarse angular to subround 20% sand, fine to coarse 10% silt, nonplastic light brown 7.5YR6/4 moist, strong reaction to HCL			
	126				26	127.60' Eventual Static Water
	128					
15:10	130					1.0 min/ft
15:21					27	
	132					
	134					
	136				28	First Saturated Cuttings
	138					
15:29	140		- so clay, increase in plasticity		29	0.8 min/ft ~140'
7/14/05				PID (0.0)		
8:32	142					
	144					
	146				30	
				(0.2)		
	148		- weakly cemented	(0.1)		
8:44	150				31	1.2 min/ft

TEAD Phase II RFI @ SWMU 58 | HOLE NO. D-19 | SIGNATURE OF INSPECTOR [signature] | DATE 7/14/05

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	PID CORE/H.S	TEMP	REMARKS VAPOR * SAMPLE ID
8:48			Weakly cemented		31	
	152		Silty clay with gravel (CL)	0.1 (PID)		
854	154					
8:57				0.2		MOVE FULL DRUM # PARSNZ0519501
	156				32	
			- Abundant weak cement ~20% gravel clasts angular to subrounded fine to coarse, cement is pinkish gray 5YR 7/2		33	
	158			0.0		
9:04	160					1.3 MIN/ft
9:08					34	
	162		Well graded gravel with sand (GW) 60% cobble to gravel, fine to coarse Angular to subrounded, 40% Med to coarse sand	0.0		
	164					
9:15						
9:21	166		Silty Gravel w/sand (GM)		35	MOVE FULL DTUM # PARSNZ0519502
				0.1		
	168					
9:27					36	
	170		EOH	0.0		Move Full Drum # RARSNZ0519507
	172					
	174					
	176					
	178					
	180					
	182					
	184					
	186					
	188					
	190					

PROJECT TEAD Phase II RFI — HOLE NO. D-19

311 Rock Avenue • Golden, CO 80401
PH 303.526.4432 • FAX 303.526.4426
email: PedlerRAS@aol.com • www.rasinc.org

Integrated Subsurface Evaluation

D-19

COMPANY	: Parsons			OTHER SERVICES:	
WELL	: D-19			None	
LOCATION/FIELD	: None			None	
COUNTY	: None			None	
STATE	: UT				
SECTION	: None	TOWNSHIP	: None	RANGE	: None
DATE	: 09/10/05	PERMANENT DATUM	: TOPVC		
DEPTH DRILLER	: 170			KB	: None
LOG BOTTOM	: 166.80	LOG MEASURED FROM:	None	DF	: None
LOG TOP	: 0.60	DRL MEASURED FROM:	None	GL	: 4494.99
CASING DIAMETER	:	LOGGING UNIT	: 202		
CASING TYPE	: PVC	FIELD OFFICE	:		
CASING THICKNESS:	0	RECORDED BY	: DM		
BIT SIZE	: 6	BOREHOLE FLUID	: 0	FILE	: ORIGINAL
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 9512A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

7379876.47N
1406330.96E

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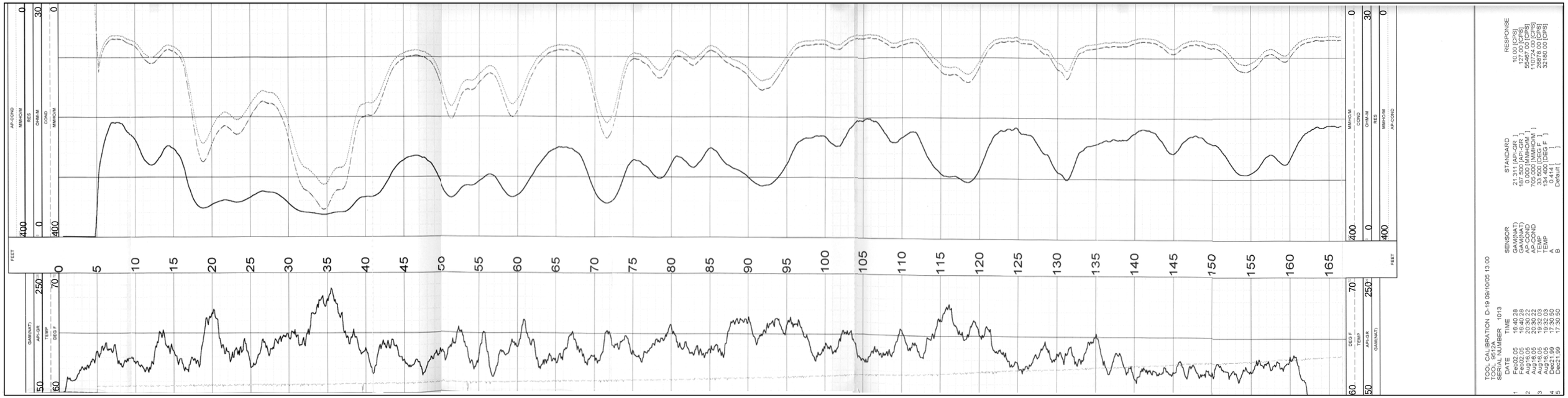
KLEINFELDER
PARSONS
Date:01/18/2006
Project Number 48743.1B

TEAD Phase II RFI

WELL D-19
NATURAL GAMMA AND
INDUCTION ELECTRICAL LOGS

PLATE
C-2a



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KLEINFELDER
PARSONS

Date: 03/24/2005
Project Number 48743.1B

TEAD Phase II RFI

WELL D-19
NATURAL GAMMA AND INDUCTION LOGS

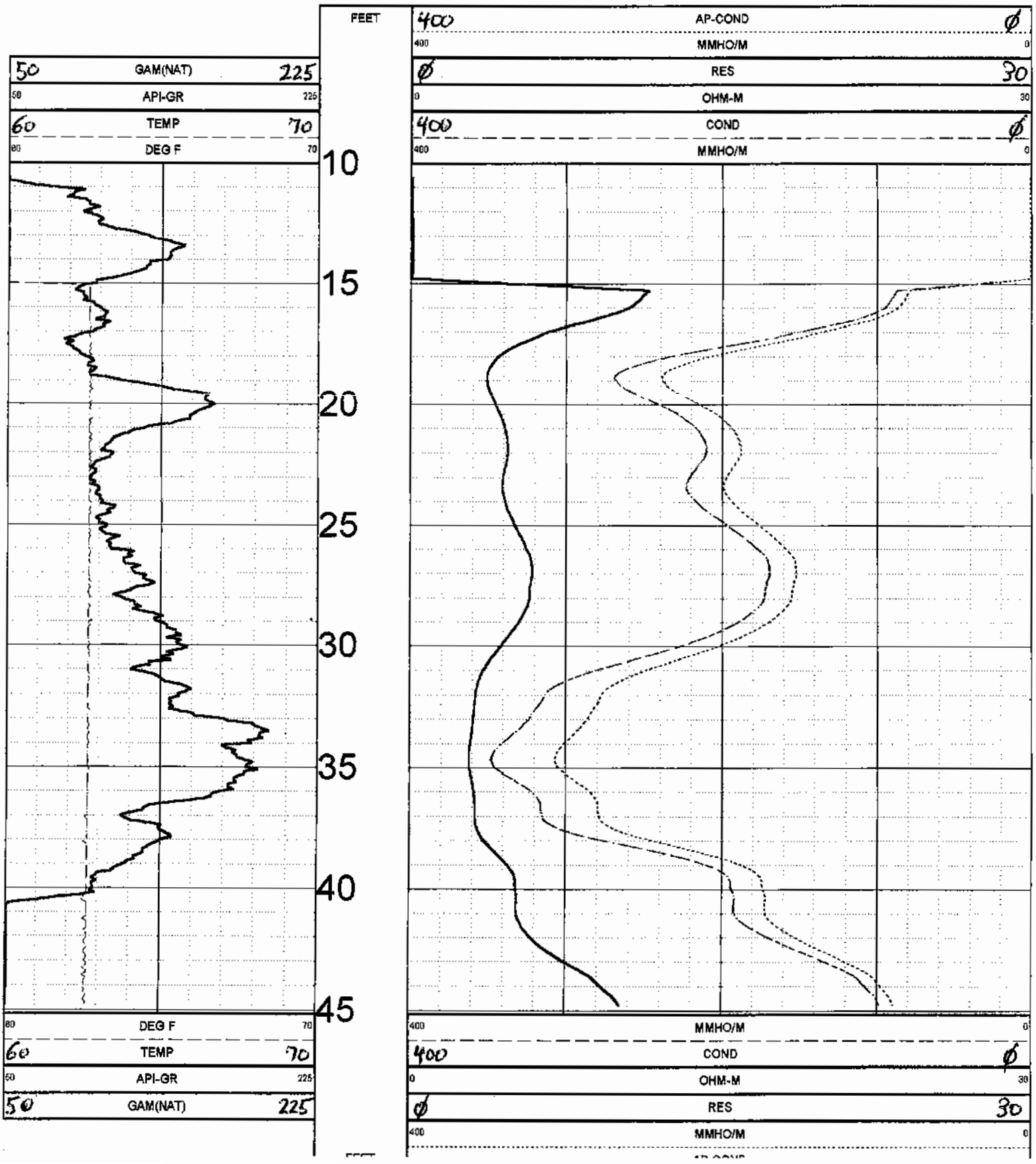
PLATE

C-2b

RAS
Integrated Subsurface Evaluation

311 Rock Avenue • Golden, CO 80401
PH 303.526.4432 • FAX 303.526.4426
email: PedlerRAS@aol.com • www.rasinc.org

D-19
Repeat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50
GAM(NAT)
225
50
API-GR
225
60
TEMP
70
60
DEG F
70
10
15
20
25
30
35
40
45
60
DEG F
70
60
TEMP
70
50
API-GR
225
50
GAM(NAT)
225
400
AP-COND
0
400
MMHO/M
0
0
RES
30
0
OHM-M
30
400
COND
0
400
MMHO/M
0
400
MMHO/M
0
400
COND
0
0
OHM-M
30
0
RES
30
400
MMHO/M
0

TOOL CALIBRATION D-19-Rpt 09/10/05 13:17
TOOL 9512A
SERIAL NUMBER 1013

	DATE	TIME	SENSOR	STANDARD	RESPONSE
1	Feb02,05	16:40:28	GAM(NAT)	21.311 [API-GR]	10.00 [CPS]
	Feb02,05	16:40:28	GAM(NAT)	187.500 [API-GR]	127.00 [CPS]
2	Aug16,05	20:30:22	AP-COND	0.000 [MMHO/M]	55467.00 [CPS]
	Aug16,05	20:30:22	AP-COND	705.000 [MMHO/M]	110724.00 [CPS]
3	Aug16,05	19:32:03	TEMP	33.500 [DEG F]	26878.00 [CPS]
	Aug16,05	19:32:03	TEMP	134.400 [DEG F]	32180.00 [CPS]
4	Dec21,99	17:30:50	A	0.414 [ ]	
5	Dec21,99	17:30:50	B	Default [ ]	

311 Rock Avenue • Golden, CO 80401
PH 303.526.4432 • FAX 303.526.4426
email: PedlerRAS@aol.com • www.rasinc.org

Integrated Subsurface Evaluation

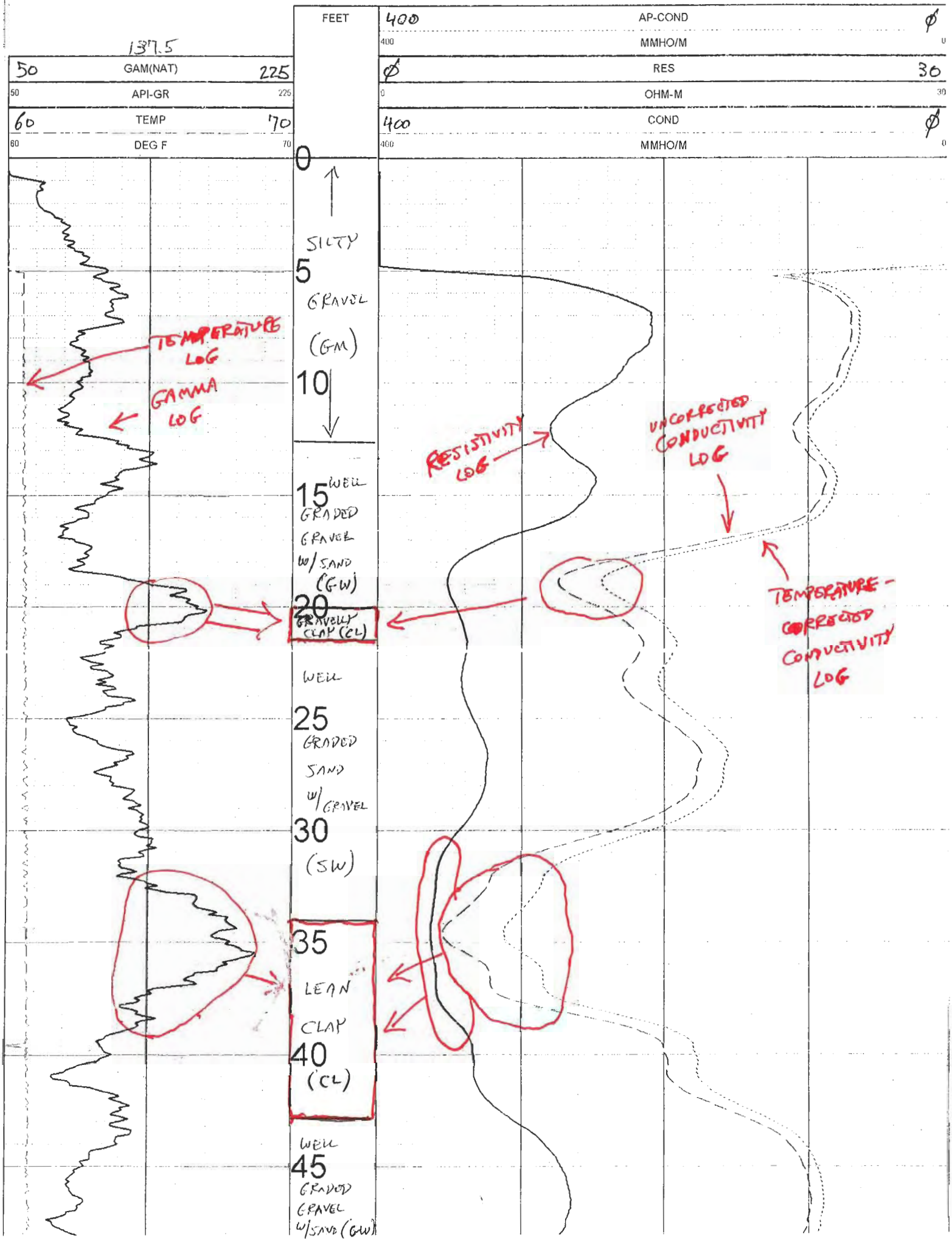
D-19

COMPANY	: Parsons			OTHER SERVICES:	
WELL	: D-19			None	
LOCATION/FIELD	: None			None	
COUNTY	: None			None	
STATE	: UT				
SECTION	: None	TOWNSHIP	: None	RANGE	: None
DATE	: 09/10/05	PERMANENT DATUM	: TOPVC		
DEPTH DRILLER	: 170			KB	: None
LOG BOTTOM	: 166 80	LOG MEASURED FROM	: None	DF	: None
LOG TOP	: 0 60	DRL MEASURED FROM	: None	GL	: 4494 99
CASING DIAMETER	:	LOGGING UNIT	: 202		
CASING TYPE	: PVC	FIELD OFFICE	:		
CASING THICKNESS	: 0	RECORDED BY	: DM		
BIT SIZE	: 6	BOREHOLE FLUID	: 0	FILE	: ORIGINAL
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 9512A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH	: 2500

7379876.47N
1406330.96E

INTERPRETATION OF DOWNHOLE GEOPHYSICAL LOGS

BOREHOLE GEOLOGY FROM GEOLOGIC BORING LOG BY MATT IVORS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50 GAM(NAT) 225
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60 TEMP 70
60 DEG F 70
FEET
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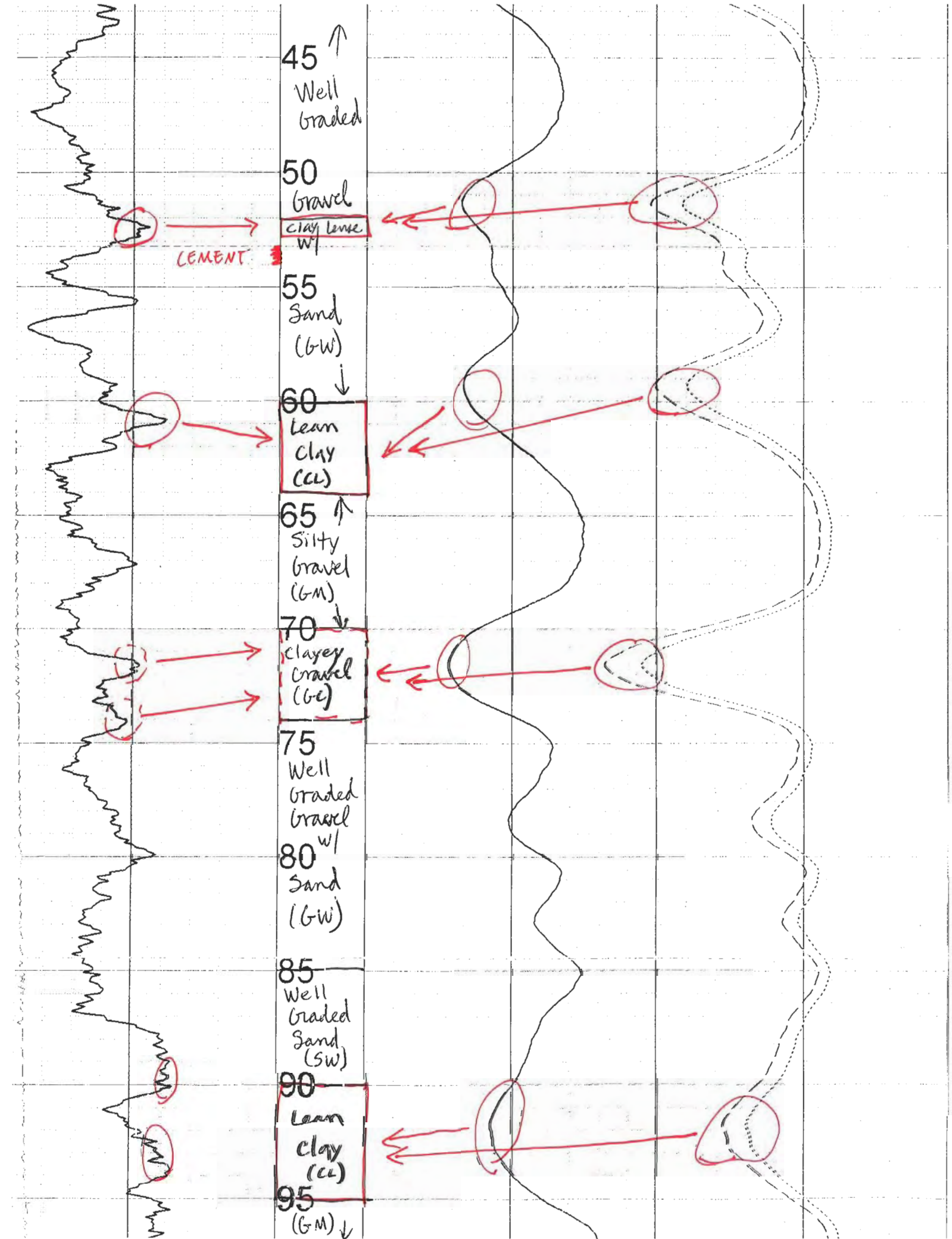
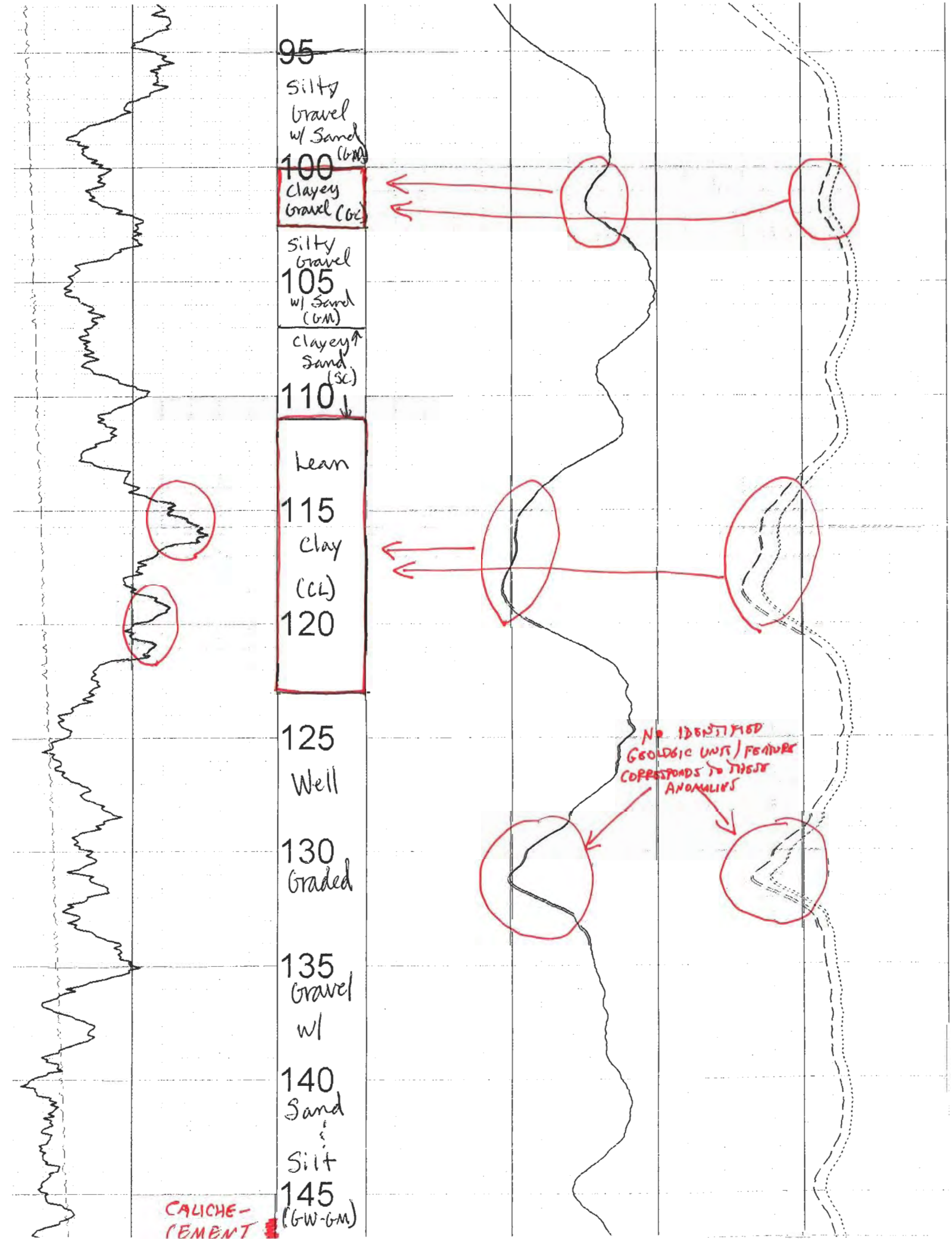
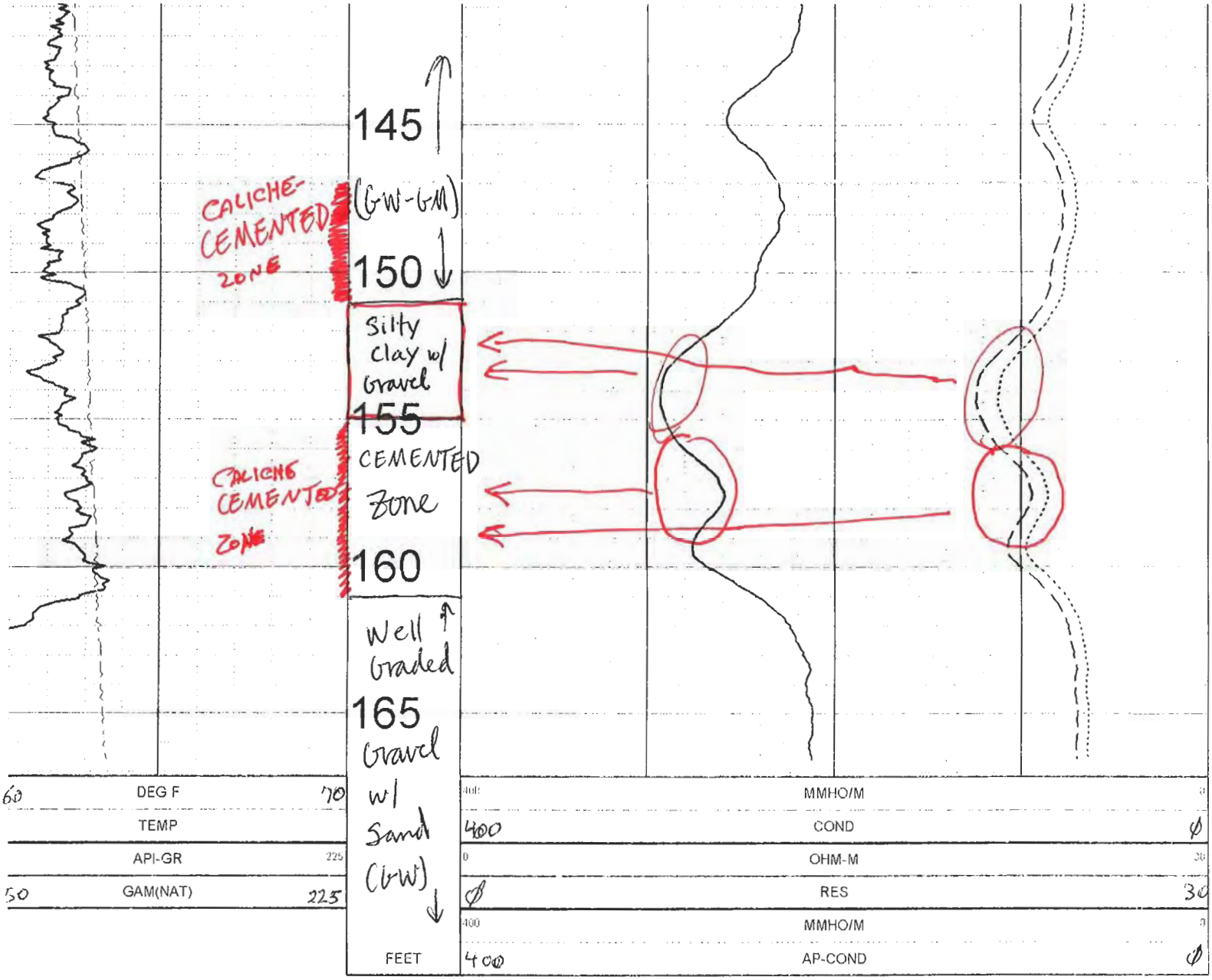
400 MMHO/M 0
0 RES 30
0 OHM-M 30
400 COND 0
400 MMHO/M 0
0
SILTY
5
GRAVEL
(GM)
10
15
WELL GRADED GRAVEL W/ SAND (GW)
20
GRAVELLY CLAY (CL)
WELL
25
GRADED SAND W/ GRAVEL
30
(SW)
35
LEAN CLAY
40
(CL)
WELL
45
GRADED GRAVEL W/SAND (GW)
TEMPERATURE LOG
GAMMA LOG
RESISTIVITY LOG
UNCORRECTED CONDUCTIVITY LOG
TEMPERATURE-CORRECTED CONDUCTIVITY LOG


45
Well
Graded
50
Gravel
clay lense
w/
CEMENT
55
Sand
(GW)
60
Lean
Clay
(CL)
65
Silty
Gravel
(GM)
70
clayey
Gravel
(GC)
75
Well
Graded
Gravel
w/
80
Sand
(GW)
85
Well
Graded
Sand
(SW)
90
Lean
Clay
(CL)
95
(GM)


95
Silty Gravel w/ Sand (GM)
100
Clayey Gravel (GC)
Silty Gravel w/ Sand (GM)
105
Clayey Sand (SC)
110
Lean Clay (CL)
115
120
125
Well
130
Graded
135
Gravel w/
140
Sand & Silt
145
(GW-GM)
CALICHE-CEMENT
NO IDENTIFIED GEOLOGIC UNIT / FEATURE CORRESPONDS TO THESE ANOMALIES



TOOL CALIBRATION D-19 09/10/05 13:00
TOOL 9512A
SERIAL NUMBER 1013

DATE	TIME	SENSOR	STANDARD	RESPONSE
Feb02,05	16:40:28	GAM(NAT)	21.311 [API-GR]	10.00 [CPS]
Feb02,05	16:40:28	GAM(NAT)	187.500 [API-GR]	127.00 [CPS]
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Aug16,05	20:30:22	AP-COND	705.000 [MMHO/M]	110724.00 [CPS]
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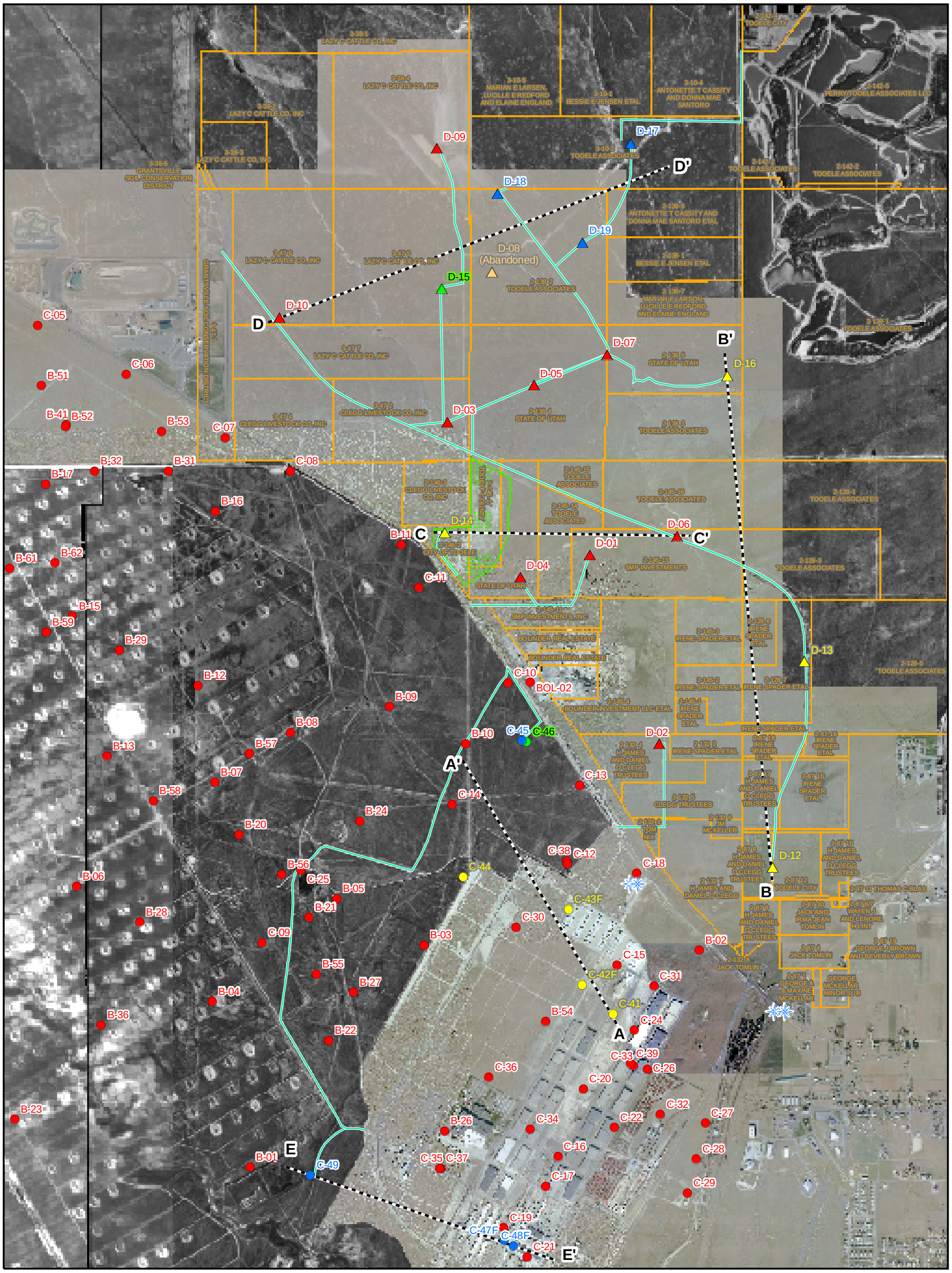
Dec21,99	17:30:50	A	0.414 [ ]	
Dec21,99	17:30:50	B	Default [ ]	



LEGEND

Offsite Groundwater Monitoring Wells
- Phase I RFI Well
- Phase I RFI Well - Abandoned
- Phase II RFI - Installed Fall-Winter 2004
- Phase III RFI - Installed Summer 2005
- Proposed Phase II RFI Well

TEAD/UID Groundwater Monitoring Wells
- Existing Well
- Phase II RFI Well - Installed Fall-Winter 2004
- Phase II RFI Well - Installed Summer-Fall 2005
- Proposed Phase II RFI Well

- Survey Benchmark
- Approximate Phase II RFI Well Access Route
- Cross Section Line
- Former Landfill
- Parcel Boundaries / Owners

SWMU 58
PHASE II RFI
TOOELE ARMY DEPOT
TOOELE, UTAH

0 900 1,800
Feet

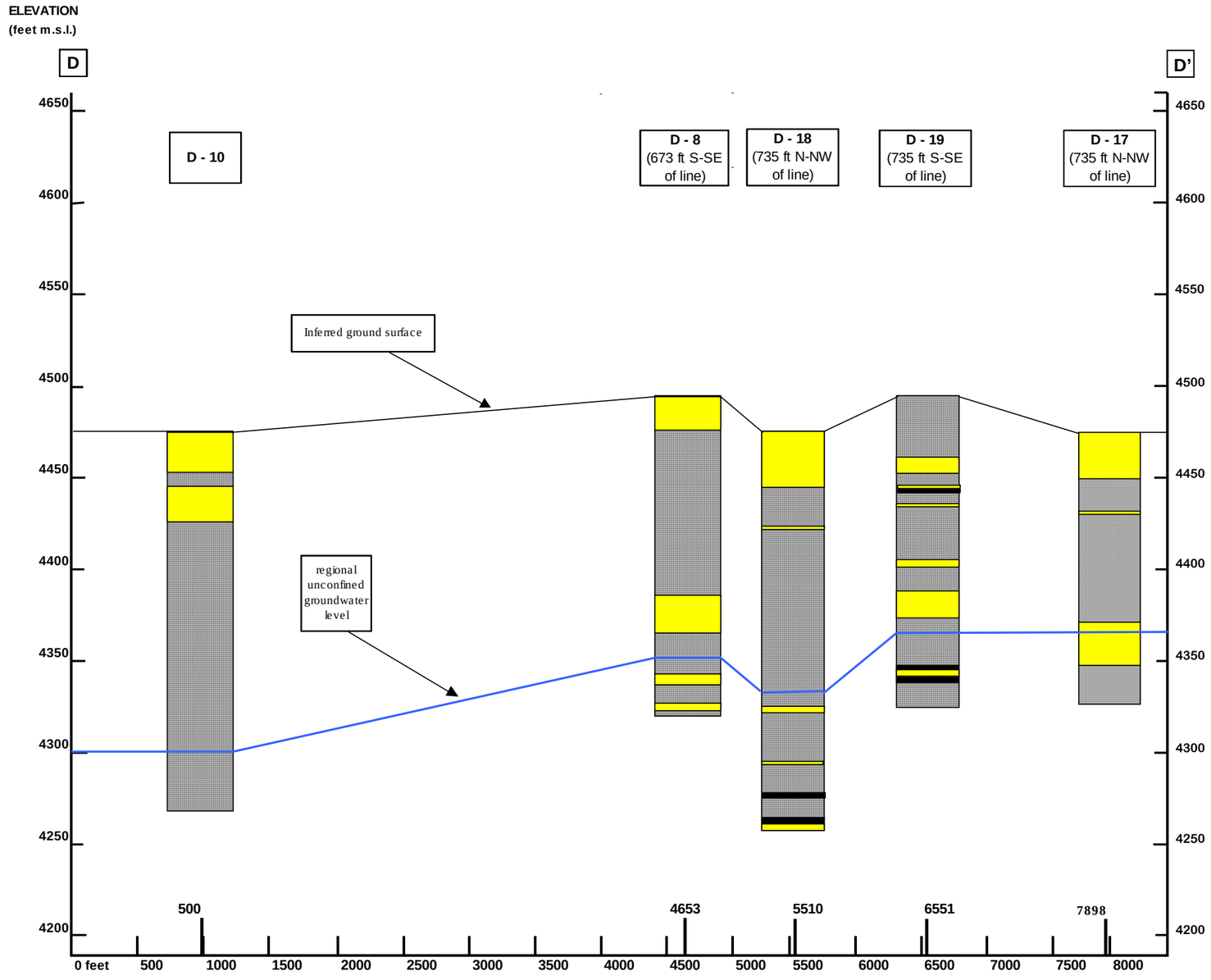
N

PLATE C-3

CROSS SECTION LOCATION DIAGRAM

w:\tooele\maps\well_comp_report_sept2005\cross_section_locations.mxd 01/09/06

PARSONS



VERTICAL EXAGERATION 6.6 X **GROUNDWATER ELEVATIONS FOR D-10, D-17, D-18, D-19 TAKEN SEPTEMBER, 2005** **D-8 TAKEN SEPTEMBER, 2002**

coarse grained sediments		Poorly graded sand and gravels (SP & GP) Silty sand and gravels (GM & SM)
fine grained sediment		Clayey sands and gravels (SC & GC) Lean clay with sand or gravel (CL) Fat clays (CH) and silts (ML)
cemented sediments		Chemically precipitated carbonate cementation of the sediment interstices

SLC5Q044.ppt

KLEINFELDER
PARSONS
Date: 09/30/2005
Project Number 48743.1B

TEAD Phase II RFI @ SWMU 58

HYDROSTRATIGRAPHIC CROSS SECTION D - D'

PLATE
C-4

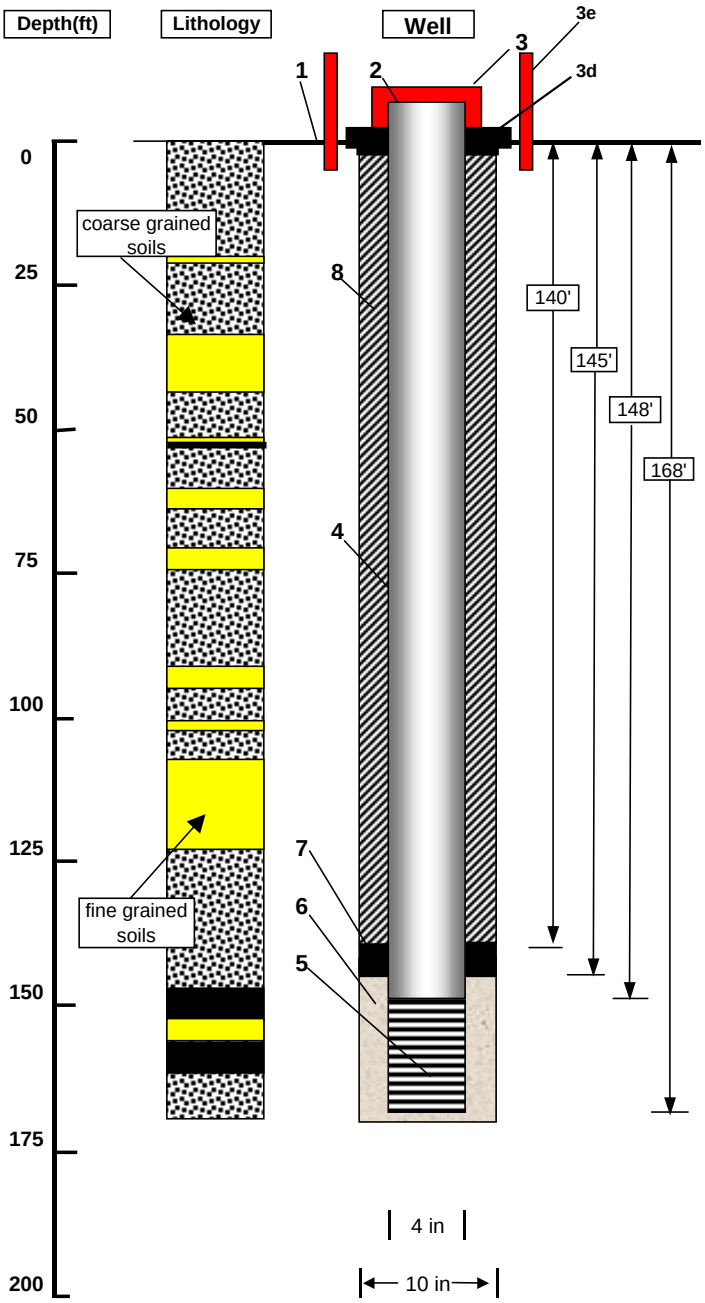
APPENDIX D

CONTRACTOR	WELL NUMBER	FIGURE
Kleinfelder/Parsons	D - 19	D-1

TEAD Phase II RFI - SWMU 58

MONITORING WELL INSTALLATION DATA RECORD

PROJECT :	**Phase II RFI - SWMU 58**	LOCATION :	**Tooele County, Utah**
DRILLING SUBCONTRACTOR :	**Layne Geoconstruction**	DRILLER:	**Tom Kern**
DRILLING METHOD AND EQUIPMENT:	**Becker Hammer-Drill Systems AP1000**	HELPERS:	**Jake smith**
WATER LEVEL : **130.81 ft (TOC) on 7/20/05**	START**: 7/13/05** END: **7/15/05**	GEOLOGIST:	**Matt Ivers**



DRAWING NOT TO SCALE

1- Ground elevation at well : 4494.99 feet above sea level

2- Measuring point elevation : 4497.75 feet (top of well casing)

3- Surface completion casing :
- a) type / diameter (ID/ OD) : Steel - 10 inch ID / 10 3/8 inch OD
- b) height above ground : 3 feet
- c) length below ground : 3 feet
- d) type / quantity of sealant : Portland cement / 30 - 92.6 lb bags
- e) protective bollards : 4 - 4 inch steel concrete filled (4' ags - 2' bgs)

4- Well casing :
- a) type / diameter (ID/ OD) : Schedule 40 PVC / 4 inch
- b) height above ground : 2.76 feet
- c) length below ground : 168.39 feet
- d) type / quantity of sealant : see # 8
- e) well centralizers : none

5- Well screen :
- a) type / diameter (ID/ OD) : Schedule 40 PVC / 4 inch
- b) slot size : .010 inch
- c) lengths : 2 - 10 foot sections (148 to 168 feet bgs)

6- Well screen filter pack :
- a) type : #16 / 40 Colorado Silica Sand
- b) quantity used : 18 - 50 lb bags
- c) method of placement : poured from surface
- d) length : 145.2 to 170 feet bgs

7- Bentonite seal :
- a) type/ quantity : Cetco coated pellets / 2 - 5 gallon buckets
- b) length : 139.9 to 145.2 feet bgs

8- Grout :
- a) grout mix used per batch : 28 gal water to 2 - 50 lb bags Pure Gold Bentonite
- b) method of placement : pumped from surface
- c) qty of well casing grout : 29 bags (approx 406 gallons)

Well development :
- a) method : bail and swab / pump and back flush
- b) time : 2 hour 45 minutes / 2 hours 13 minutes

Pumping tests :
- a) draw down / time : 0.10 feet / 37 minutes
- b) pumping rate : 10.05 to 10.18 gpm

SUMMARY OF WELL SURVEY DATA
TEAD Phase II RFI Groundwater Monitoring Wells

Well No.	Elevations (ft above MSL) Measuring Point	Brass Cap	Ground Surface	Top of Well Screen	Bottom of Well Screen	Coordinates for Measuring Point Northing	Coordinates for Measuring Point Easting	Section	Range	Township	PVC Riser Stickup
C-41	**4804.70**	**4802.32**	**4801.67**	**4445.68**	**4425.68**	**7364933.324**	**1406930.413**	30	R 4 W	T 3 S	3.03
C-42F	**4785.09**	**4785.52**	**4785.27**	**4445.27**	**4425.27**	**7365504.752**	**1406335.618**	19	R 4 W	T 3 S	-0.18
C-43F	**4754.87**	**4755.23**	**4755.21**	**4436.21**	**4416.21**	**7366968.52**	**1406061.58**	19	R 4 W	T 3 S	-0.34
C-44	**4722.81**	**4720.44**	**4719.82**	**4439.82**	**4419.82**	**7367591.88**	**1404021.61**	24	R 5 W	T 3 S	2.99
C-45	**4689.99**	**4687.78**	**4687.20**	**4438.20**	**4418.20**	**7370229.15**	**1405164.18**	19	R 4 W	T 3 S	2.79
C-47F	**4824.53**	**4825.08**	**4825.03**	**4476.08**	**4446.08**	**7360556.94**	**1404815.63**	30	R 4 W	T 3 S	-0.50
C-48F	**4823.67**	**4824.08**	**4824.03**	**4475.08**	**4445.08**	**7360431.77**	**1404989.18**	30	R 4 W	T 3 S	-0.36
C-49	**4710.02**	**4707.49**	**4706.90**	**4447.49**	**4427.49**	**7361802.01**	**1401065.35**	25	R 5 W	T 3 S	3.12
D-12	**4803.05**	**4800.56**	**4800.25**	**4455.25**	**4435.25**	**7367777.995**	**1410018.176**	20	R 4 W	T 3 S	2.80
D-13	**4720.05**	**4717.40**	**4717.32**	**4355.32**	**4335.32**	**7371760.079**	**1410629.706**	17	R 4 W	T 3 S	2.73
D-14	**4592.80**	**4590.93**	**4590.39**	**4335.39**	**4315.39**	**7374264.49**	**1403669.88**	13	R 5 W	T 3 S	2.41
D-16	**4580.11**	**4577.75**	**4577.20**	**4346.20**	**4326.20**	**7377300.289**	**1409139.940**	7	R 4 W	T 3 S	2.91
D-17	**4476.25**	**4473.81**	**4473.24**	**4343.24**	**4323.24**	**7381795.49**	**1407265.97**	6	R 4 W	T 3 S	3.01
D-18	**4476.07**	**4473.89**	**4473.20**	**4318.20** **4293.20**	**4298.20** **4268.20**	**7380823.93**	**1404691.14**	7	R 4 W	T 3 S	2.87
D-19	**4497.75**	**4495.75**	**4494.99**	**4346.99**	**4326.99**	**7379876.47**	**1406330.96**	7	R 4 W	T 3 S	2.76

MSL: mean sea level
F for selected well identifiers designates flush-mount surface completion.
Coordinates for measuring point are US State plane 1983, Utah Central 4302, NAD 1983 (CONUS), GEO1D96 (continental US)
All survey data generated by Ward Engineering of Salt Lake City, Utah

Note that well D-18 has two screened intervals.

APPENDIX E

VEOLIA Water

TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA

Well ID: D-19	Initial Depth to Water: 130.81'
Sample ID:	Total Depth of Well: 171.15'
Duplicate ID:	Well Diameter: 4"
Sample Depth:	(a) 1 Casing Volume:
Date: 7/20/05	(b) 1 Filter Pack Water Volume:
Sampled By: JRA	(a)+(b)x 3= Minimum Volume to Purge:
Method of ~~Sampling~~ Development 4" SS Bailer	Method of ~~Purging~~ Development 4" S.S. Bailer

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
0856	*1st	Bailer	3	66.7	7.31	1046	>1000					Tan Fine sm
0924	10th	Bailer	30	67.0	7.36	1035	>1000					Tan fine sm
0947	20th	Bailer	60	69.9	7.35	1068	>1000					Tan silty
0949	Surging		well	w/	surge	Block						
1041	30th	Bailer	90	74.7	7.34	1169	>1000					Tan Some Si
1044	Surging well w/ surge block											
1141	40th	Bailer	120	76.1	7.33	1153	>1000					Tan none

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution	990	Standard	5.39
Instrument reading		7.0 0837	10.0 0840	Instrument reading	990 0844	Instrument reading	5.39 0847

Notes: *Bailer holds 3 gal

VEOLIA Water

TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA

Well ID: D-19	Initial Depth to Water: 130.81
Sample ID:	Total Depth of Well: 171.15
Duplicate ID:	Well Diameter: 4"
Sample Depth:	(a) 1 Casing Volume: 27 gal
Date: 7/20/05	(b) 1 Filter Pack Water Volume:
Sampled By: JAT	(a) + (b) x 3 = Minimum Volume to Purge: 81 gal
Method of ~~Sampling~~ Development: 4" S.S. Submersible	Method of ~~Purging~~ Development: 4" S.S. Submersible

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
1324	170	10.05	0									
1333	170	10.05	90	76.9	7.33	1160	58.2					Cloudy none
1342	170	10.18	180	77.0	7.31	1149	51.6					Cloudy none
1351	170	10.05	270	76.4	7.43	1134	48.7					Cloudy none
1400	170	[illegible]	360	76.0	7.32	1141	26.7					Clear none
1401	Pump	off,	for Re	covery	Port	ion of	pump	Test,	Also to	Back	flush	well
1424	Parameters after	Backflush		74.9	7.35	1124	129					Cloudy none
1433	170	10.05	450	73.9	7.37	1106	36					Cloudy none
1442	170	10.18	540	73.8	7.39	1108	13.3					Clear none
1451	170	10.05	630	74.5	7.35	1120	10.3					Clear none
~~1500~~ 1501	170	1500 10.05	720	73.9	7.37	1070	7.14					Clear none
1501	Pump	off Backflushed			well	5x						

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution		Standard	
Instrument reading				Instrument reading		Instrument reading	

Notes: 9 90

VEOLIA Water

TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA

Well ID: O-19	Initial Depth to Water:
Sample ID:	Total Depth of Well:
Duplicate ID:	Well Diameter:
Sample Depth:	(a) 1 Casing Volume:
Date:	(b) 1 Filter Pack Water Volume:
Sampled By:	(a)+(b)x 3= Minimum Volume to Purge:
Method of Sampling:	Method of Purging:

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
1510	Parameters after		Backflush	71.9	7.40	1082	33.2					Clear none
1519	170	10.05	810	73.8	7.41	1121	3.89					Clear none
1528	170	10.18	900	73.6	7.37	1079	1.89					Clear none
1537	170	10.05	990	74.1	7.40	1084	2.01					Clear none

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution		Standard	
Instrument reading				Instrument reading		Instrument reading	

Notes: Pg 2 of 2

Wednesday July 20, 2005
Weather: Clear, Hot ~90°
Wind: Breeze from South

0747 Arrive at D-19 and start Set up
SWL 130.81' TD 171.15
0830 Calibrated equipment
0856 1st Bailer removed, Parameters Taken
0924 10th Bailer removed, Parameters Taken
0947 20th Bailer removed, Parameters Taken
0949 Surging well w/Surge Block
1041 30th Bailer removed, Parameter Taken
1044 Surging well w/Surge block
1141 40th Bailer removed, Parameters Taken
1202 Lowering pump and piping
1323 Pump on, establishing flow, Also Drawdown portion of pump test started
1324 Flow established at 10 gpm, Intake ~170
1401 Pump off, for Recovery Portion of Pump Test, Also backflushed well 5x
1454 Pump on, Parameters Taken after Backflush
1501 Pump off, Backflushed well 5x
1510 Pump on, Parameters Taken after Backflush
1537 Pump off, Parameters Stable, Turbidity at 2.01 NTU's
1542 ~~Pump o~~ JH Removing pump and piping
1604 Decon Equipment
1638 Leaving D-19 → GW TP

Owner Tooele Army Depot Address _____ County Tooele State UT

Date 7/20/05 Company performing test Parsons/Veolia Water Measured by JLB Hamman

No. 0-19 Distance from pumping well _____ Type of test Drawdown/Recovery constant pumping rate Test No. _____

Measuring equipment Solinst Water Level meter

Time Data
Pump on: Date 7/20 Time 1323 (t)
Pump off: Date 7/20 Time 1400 (t')
Duration of aquifer test: Pumping 37 min. Recovery 15 min.

Water Level Data
Static water level 131.10
Measuring point Top of PVC casing
Elevation of measuring point _____

Discharge Data
How Q measured inline flowmeter
Depth of pump/air line 1057 BTOC
Previous pumping? Yes ____ No ____
Duration _____ End _____

Comments on factors affecting test data

Date	Clock time	Time since pump started t	Time since pump stopped t'	t/t'		Depth to water / Water level measurement	Correction or Conversion	Water level	Water level change s or s'		Discharge measurement	(GPM) Rate		
7/20	1323	0				131.10								Pump on
	1324	1				131.20					10.05			
	1325	2				131.20					10.05			
	1326	3				131.20					10.18			
	1327	4				131.20					10.18			
	1332	9				131.20					10.05			
	1340	17				131.20					10.05			
	1351	28				131.20					10.05			
	1400	37				131.20					10.05			
	1401	38	1			131.10								
	1402	39	2			131.10								
	1403	40	3			131.10								
	1405	42	5			131.10								
	1410	47	10			131.10								
	1415	52	15			131.10								

APPENDIX F

September 15, 2005
Weather: Clear, Cool ~70°
Wind: Breeze from South

1012 Arrive at C-45 and start Setup
SWL 229.96 (BTOC)
1150 Installed 5 samplers, 3 at 249 ft bgs, Top of Sampler, 1 at 259 ft bgs (Top) and 1 at 269 ft bgs bottom of Sampler
1205 Leaving C-45 → D-17
1337 Arrive at D-17 and start Setup
SWL 112.53 (BTOC)
1346 Installed 1 Sampler at 140 ft bgs, Top of Sampler
1354 Leaving D-17 → D-19
1357 Arrive at D-19 and start setup
SWL 133.00 (BTOC)
1419 Installed 5 Samplers. 3 at 148 ft bgs, Top of Samples, 1 at 158 ft bgs, Top of Sampler and 1 at 168 ft bgs, bottom of sampler
1431 Leaving D-19 → D-18
Arrive at D-18 and start Setup
SWL 142.98 (BTOC)
1521 Installed 8 Samplers 3 at 155 ft bgs, Top of Sampler, 1 at 165 ft bgs, Top of Sampler and 1 at 175 ft bgs, bottom of Sampler. 1 at 180 ft bgs Top of Sampler, 1 at 192 ft bgs, Top of Sampler, and 1 at 205 ft bgs, Bottom of Sampler
1542 Leaving D-18 → GWTP

Tuesday October 4, 2005
Weather: Cloudy, Rain ~ 60°
Wind: None

0732 Arrive at C/SH D-19 and preparing to Sample
0754 Removing Samplers
15 VOA Samples Taken 40 mL w/HCL
(0805) (3) D-19FD001 (148')
0758 (3) D-19GW001 (148')
0758 (3) D-19FR001 (148')
0807 (3) D-19GW002 (158')
0810 (3) D-19GW003 (168')
0821 Leaving D-19 → D-17
0826 Arrive at D-17 and preparing to Sample
0834 Removing Samplers
JM ~~0836~~ 3 VOA Samples Taken 40 mL w/HCL
0836 (3) ~~GW001~~ SH D-17GW001 (140')
0843 Leaving D-17 → D-18
0849 Arrive at D-18 and preparing to Sample
18 VOA's Taken 40 mL w/HCL
0920 (3) D-18GW007 (155')
0924 (3) D-18GW008 (165')
0927 (3) D-18GW009 (175')
0930 (3) D-18GW010 (180')
0933 (3) D-18GW011 (192')
0936 (3) D-18GW012 (205')
0952 Leaving D-18 → GWTP
1502 Arrive at C-48F and preparing to Sample
1512 Removing samplers
12 VOA Samples Taken 40 mL w/HCL
1516 (3) C-48FGW001 (355')
1519 (3) C-48FGW002 (363')
1522 (3) C-48FGW003 (371')
1526 (3) C-48FGW004 (379')

ANALYTICAL QUALITY CONTROL SUMMARY

Samples were collected in accordance with the analytical and quality control specifications of the Final Phase II RCRA Facility Investigation SWMU-58 Work Plan (Parsons, 2003) and the Tooele Industrial Area Project CDQMP and QAPP. Passive diffusion bag samplers were deployed in well D-19 on September 15, 2005. Samples including field quality control samples were collected on October 4, 2005 and submitted to Severn Trent Laboratories, a Utah and USACE-certified analytical laboratory.

Results were received and submitted to third party data review by Synectics. Data review included checks of the following data quality elements: Holding times, continuing calibration verification, method blanks, field blanks, laboratory control sample recovery, matrix spike and matrix spike duplicate recovery and precision, surrogate recovery, and field duplicate precision. There were minor quality control issues found in the data package for D-19. The TCE results were J/UJ flagged for reanalysis holding times >14 days. 1,1-dichloroethene results were J/UJ flagged due to LCS % recovery issues. All data is suitable for use. Analytical and data validation reports are attached.

SEVERN TRENT STL®

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

October 30, 2005

STL SACRAMENTO PROJECT NUMBER: G5J070276
PO/CONTRACT: 744139-30012

Jan Barbas
Parsons
406 West South Jordan Parkway
Suite 300
South Jordan, UT 84095

Dear Mr. Barbas,

This report contains the analytical results for the samples received under chain of custody by STL Sacramento on October 6, 2005. These samples are associated with your Tooele project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

Nilo Ligi
Project Manager

TABLE OF CONTENTS

STL SACRAMENTO PROJECT NUMBER G5J070276

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5J070276

General Comments

Samples were received at 2 degrees C.

WATER, 8260B, Volatile Organics

The samples were analysed for Volatile Organics by Method 8260B (GC-MS). Detection is achieved by purge and trap gas chromatography – Mass Spectrometry. All QC criteria were met except as noted below.

Samples 6, 8, 9, 10-14

Samples were all analyzed before the holding time expired. However, review of the data showed that 1 or more analytes were present in the sample at levels outside of the instrument calibration range. As a consequence, these samples were reanalyzed at dilutions, but the reanalysis was past the holding time date. Both sets of data will be reported.

Due to possible carry over contribution sample G5J070276-14 was reanalyzed two days beyond recommended hold time. Results for both analyses are reported.

There were no other anomalies associated with this project.

SEVERN TRENT STL

ACCREDITED IN ACCORDANCE WITH NELAP

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0164	Pennsylvania	68-00472
Arkansas	04-067-0	South Carolina	87014002
California	01168CA	Texas	T104704
Colorado	NA	Utah*	QUAN1
Connecticut	PH-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	961	West Virginia	9930C,9931
Hawaii	NA	Wisconsin	998204680
Louisiana	01944	WSDOE	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	S-32605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary
G5J070276

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
HL9K7	1	D-19FD001	10/4/2005 08:05 AM	10/6/2005 09:10 AM
HL9LG	2	D-19GW001	10/4/2005 07:58 AM	10/6/2005 09:10 AM
HL9LR	3	D-19GW002	10/4/2005 08:07 AM	10/6/2005 09:10 AM
HL9LX	4	D-19GW003	10/4/2005 08:10 AM	10/6/2005 09:10 AM
HL9L4	5	D-17GW001	10/4/2005 08:36 AM	10/6/2005 09:10 AM
HL9L5	6	C-45FD001	10/3/2005 08:50 AM	10/6/2005 09:10 AM
HL9L8	7	C-45GW001	10/3/2005 08:41 AM	10/6/2005 09:10 AM
HL9MD	8	C-45GW002	10/3/2005 09:03 AM	10/6/2005 09:10 AM
HL9MH	9	C-45GW003	10/3/2005 09:08 AM	10/6/2005 09:10 AM
HL9MJ	10	C-48FGW001	10/4/2005 03:16 PM	10/6/2005 09:10 AM
HL9ML	11	C-48FGW002	10/4/2005 03:19 PM	10/6/2005 09:10 AM
HL9MQ	12	C-48FGW003	10/4/2005 03:22 PM	10/6/2005 09:10 AM
HL9MX	13	C-48FGW004	10/4/2005 03:26 PM	10/6/2005 09:10 AM
HL9M3	14	D-18GW007	10/4/2005	10/6/2005 09:10 AM
HL9NL	15	D-18GW008	10/4/2005	10/6/2005 09:10 AM
HL9NP	16	D-18GW009	10/4/2005	10/6/2005 09:10 AM
HL9NT	17	D-18GW010	10/4/2005	10/6/2005 09:10 AM
HL9NW	18	D-18GW011	10/4/2005	10/6/2005 09:10 AM
HL9N3	19	D-18GW012	10/4/2005	10/6/2005 09:10 AM
HL9N5	20	PARSTB12	10/3/2005 07:00 AM	10/6/2005 09:10 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

SAMPLE RECEIPT RECORDS

GSJ070276

CHAIN OF CUSTODY

PARSONS

COC ID: 1014

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-19	D-19	D-19FD001	WG	DF	N	1	10/4/05	0805	gdt	148'	-	3

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS					

Remarks:

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-19	D-19	D-19GW001	WG	DF	N	1	10/4/05	0758	gdt	148'	-	3

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS					

Remarks:

RECEIVED IN GOOD CONDITION
UNDER COC

OCT 06 2005

INI LS

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
D Hamann	10/5/05 1000		10/5/05 1000
To FedEx	10/5/05 1630		10/6/05 1440

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Friday, September 16, 2005

STL Sacramento (916) 373 - 5600

CHAIN OF CUSTODY

PARSONS

COC ID: 1016

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-19	D-19	D-19GW002	WG	DF	N	1	10/4/05	0807		158'	-	3

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS					

Remarks:

RECEIVED IN GOOD CONDITION
UNDER COC
OCT 0 6 2005
INI

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	10/5/05 1000		10/5/05 1000
To FEDEX	10/5/05 1630		10/6/05 1440

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Friday, September 16, 2005

G5J070276

CHAIN OF CUSTODY PARSONS COC ID: 1017	Project Name: Tooele Industrial Area	Contractor: Parsons-SLC	Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069
	Project Manager: Ed Staes	Installation: TEAD	
	Sample Coordinator: Kurt Alloway	Sample Program:	

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-19	D-19	D-19GW003	WG	DF	N	1	10/4/05	0810	gat	168'	–	3

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS					

Remarks:

RECEIVED IN GOOD CONDITION
UNDER COC
OCT 0 6 2005
INI JC

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
Jeff Spaman	10/5/05 1000		10/5/05 1000
TO FED EX	10/5/05 1630	Jy Sadler	10/6/05 1440

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Friday, September 16, 2005

STL Sacramento (916) 373 - 5600

G5J070276

CHAIN OF CUSTODY

PARSONS

COC ID: 1018

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	FIELDQC	PARSTB12	WQ	NA	TB	1	10/3/05	0700		0	0	2

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS					

Remarks:

RECEIVED IN GOOD CONDITION
UNDER COC
OCT 06 2005
INI JS

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	10/5/05 0800		10/5/05 0800
To: FedEx	10/5/05 1600		10/6/05 1440

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Friday, September 16, 2005

STL Sacramento (916) 373 - 5600

SEVERN TRENT **STL**

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Parsons PM NV LOG # 34926

LOT# (QUANTIMS ID) G5J070276 QUOTE# 62837 LOCATION WB

	Initials	Date
DATE RECEIVED 10/6/05 TIME RECEIVED 0910	JS	10/6/05

DELIVERED BY
- [X] FEDEX
- [ ] CA OVERNIGHT
- [ ] CLIENT
- [ ] AIRBORNE
- [ ] GOLDENSTATE
- [ ] DHL
- [ ] UPS
- [ ] BAX GLOBAL
- [ ] GO-GETTERS
- [ ] STL COURIER
- [ ] COURIERS ON DEMAND
- [ ] OTHER

CUSTODY SEAL STATUS [X] INTACT [ ] BROKEN [ ] N/A

CUSTODY SEAL #(S) ~~376684~~ JS 376684, 438930

SHIPPPING CONTAINER(S) [ ] STL [X] CLIENT [ ] N/A

TEMPERTURE RECORD (IN °C) IR 1 [X] 3 [ ] [ ] OTHER _____

COC #(S) N/A

TEMPERATURE BLANK Observed: 2 Corrected: 2

SAMPLE TEMPERATURE

Observed: 2 2 3 Average: 2 Corrected Average: 2

COLLECTOR'S NAME: [ ] Verified from COC [X] Not on COC

pH MEASURED [ ] YES [ ] ANOMALY [X] N/A

LABELED BY..... CO 10/7/05

LABELS CHECKED BY.....

PEER REVIEW _____ [X] NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING
- WETCHEM [X] N/A
- VOA-ENCORES [X] N/A

[ ] METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL [X] N/A

[X] COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES [ ] N/A

[ ] Clouseau [ ] TEMPERATURE EXCEEDED (2 °C – 6 °C)*1 [X] N/A

[ ] WET ICE [ ] BLUE ICE [ ] GEL PACK [ ] NO COOLING AGENTS USED [ ] PM NOTIFIED

Notes: _____

*1 Acceptable temperature range for State of Wisconsin samples is ≤ 4°C.

WATER, 8260B, Volatile Organics

Parsons Corporation

Client Sample ID: D-19FD001

GC/MS Volatiles

Lot-Sample #...: G5J070276-001 Work Order #...: HL9K71AA Matrix.....: WG
Date Sampled...: 10/04/05 Date Received..: 10/06/05
Prep Date.....: 10/18/05 Analysis Date..: 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	**0.66 J**	**1.0**	**ug/L**	**0.15**
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.22 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**5.9**	**1.0**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	97	(70 - 130)
1,2-Dichloroethane-d4	102	(70 - 130)
Toluene-d8	109	(70 - 130)
Dibromofluoromethane	107	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

Parsons Corporation

Client Sample ID: D-19GW001

GC/MS Volatiles

Lot-Sample #...: G5J070276-002 Work Order #...: HL9LG1AA Matrix.....: WG
Date Sampled...: 10/04/05 Date Received..: 10/06/05
Prep Date.....: 10/18/05 Analysis Date..: 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	**0.57 J**	**1.0**	**ug/L**	**0.15**
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.25 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**6.0**	**1.0**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	100	(70 - 130)
1,2-Dichloroethane-d4	102	(70 - 130)
Toluene-d8	106	(70 - 130)
Dibromofluoromethane	106	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

Parsons Corporation

Client Sample ID: D-19GW002

GC/MS Volatiles

Lot-Sample #...: G5J070276-003 Work Order #...: HL9LR1AA Matrix.....: WG
Date Sampled...: 10/04/05 Date Received..: 10/06/05
Prep Date.....: 10/18/05 Analysis Date..: 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	**0.76 J**	**1.0**	**ug/L**	**0.15**
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.20 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**6.3**	**1.0**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	100	(70 - 130)
1,2-Dichloroethane-d4	101	(70 - 130)
Toluene-d8	109	(70 - 130)
Dibromofluoromethane	108	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

Parsons Corporation

Client Sample ID: D-19GW003

GC/MS Volatiles

Lot-Sample #...: G5J070276-004 Work Order #...: HL9LX1AA Matrix.....: WG
Date Sampled...: 10/04/05 Date Received..: 10/06/05
Prep Date.....: 10/18/05 Analysis Date..: 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	**0.73 J**	**1.0**	**ug/L**	**0.15**
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.23 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**6.6**	**1.0**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	102	(70 - 130)
1,2-Dichloroethane-d4	105	(70 - 130)
Toluene-d8	114	(70 - 130)
Dibromofluoromethane	109	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

Parsons Corporation

Client Sample ID: PARSTB12

GC/MS Volatiles

Lot-Sample #...: G5J070276-020 Work Order #...: HL9N51AA Matrix.....: WQ
Date Sampled...: 10/03/05 Date Received..: 10/06/05
Prep Date.....: 10/17/05 Analysis Date..: 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	ND	1.0	ug/L	0.15
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	ND	1.0	ug/L	0.12
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	ND	1.0	ug/L	0.31
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	104	(70 - 130)
1,2-Dichloroethane-d4	93	(70 - 130)
Toluene-d8	107	(70 - 130)
Dibromofluoromethane	98	(70 - 130)

QC DATA ASSOCIATION SUMMARY

G5J070276

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WG	SW846 8260B		5292173	
002	WG	SW846 8260B		5292173	
003	WG	SW846 8260B		5292173	
004	WG	SW846 8260B		5292173	
005	WG	SW846 8260B		5292173	
006	WG	SW846 8260B		5291444	5291272
007	WG	SW846 8260B		5291444	5291272
008	WG	SW846 8260B		5291444	5291272
009	WG	SW846 8260B		5291444	5291272
010	WG	SW846 8260B		5292173	
011	WG	SW846 8260B		5292173	
012	WG	SW846 8260B		5292173	
013	WG	SW846 8260B		5292173	
014	WG	SW846 8260B		5292173	
015	WG	SW846 8260B		5292173	
016	WG	SW846 8260B		5292302	
017	WG	SW846 8260B		5292302	
018	WG	SW846 8260B		5292302	
019	WG	SW846 8260B		5292302	
020	WQ	SW846 8260B		5291444	5291272

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM1J21AA **Matrix.....:** WATER
MB Lot-Sample #: G5J180000-444

Prep Date.....: 10/17/05
Analysis Date..: 10/17/05 **Prep Batch #...:** 5291444
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	105	(70 - 130)
1,2-Dichloroethane-d4	89	(70 - 130)
Toluene-d8	102	(70 - 130)
Dibromofluoromethane	92	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 Work Order #...: HM2P71AA Matrix.....: WATER
MB Lot-Sample #: G5J190000-173

Prep Date.....: 10/18/05
Analysis Date..: 10/18/05 Prep Batch #...: 5292173
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	102	(70 - 130)
1,2-Dichloroethane-d4	96	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	102	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM3AQ1AA **Matrix.....:** WATER
MB Lot-Sample #: G5J190000-302

Prep Date.....: 10/18/05
Analysis Date..: 10/18/05 **Prep Batch #...:** 5292302
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	114	(70 - 130)
1,2-Dichloroethane-d4	125	(70 - 130)
Toluene-d8	119	(70 - 130)
Dibromofluoromethane	122	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM1J21AC **Matrix.....:** WATER
LCS Lot-Sample#: G5J180000-444
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Benzene	**91**	**(80 - 120)**	**SW846 8260B**
1,1-Dichloroethene	**89**	**(80 - 120)**	**SW846 8260B**
Toluene	**95**	**(80 - 120)**	**SW846 8260B**
Trichloroethene	**88**	**(80 - 120)**	**SW846 8260B**
Chlorobenzene	**99**	**(80 - 120)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	107	(70 - 130)
1,2-Dichloroethane-d4	88	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM1J21AC **Matrix.....:** WATER
LCS Lot-Sample#: G5J180000-444
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Benzene	**20.0**	**18.2**	**ug/L**	**91**	**SW846 8260B**
1,1-Dichloroethene	**20.0**	**17.8**	**ug/L**	**89**	**SW846 8260B**
Toluene	**20.0**	**18.9**	**ug/L**	**95**	**SW846 8260B**
Trichloroethene	**20.0**	**17.7**	**ug/L**	**88**	**SW846 8260B**
Chlorobenzene	**20.0**	**19.8**	**ug/L**	**99**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	107	(70 - 130)
1,2-Dichloroethane-d4	88	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM2P71AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5J190000-173 HM2P71AD-LCSD
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**97**	**(80 - 120)**			**SW846 8260B**
	105	**(80 - 120)**	**7.8**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethene	**89**	**(80 - 120)**			**SW846 8260B**
	102	**(80 - 120)**	**13**	**(0-30)**	**SW846 8260B**
Toluene	**102**	**(80 - 120)**			**SW846 8260B**
	108	**(80 - 120)**	**6.3**	**(0-30)**	**SW846 8260B**
Trichloroethene	**93**	**(80 - 120)**			**SW846 8260B**
	100	**(80 - 120)**	**7.2**	**(0-30)**	**SW846 8260B**
Chlorobenzene	**101**	**(80 - 120)**			**SW846 8260B**
	110	**(80 - 120)**	**8.2**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	106	(70 - 130)
	109	(70 - 130)
1,2-Dichloroethane-d4	92	(70 - 130)
	93	(70 - 130)
Toluene-d8	109	(70 - 130)
	107	(70 - 130)
Dibromofluoromethane	99	(70 - 130)
	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 Work Order #...: HM2P71AC-LCS Matrix.....: WATER
LCS Lot-Sample#: G5J190000-173 HM2P71AD-LCSD
Prep Date.....: 10/18/05 Analysis Date..: 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**20.0**	**19.5**	**ug/L**	**97**		**SW846 8260B**
	20.0	**21.0**	**ug/L**	**105**	**7.8**	**SW846 8260B**
1,1-Dichloroethene	**20.0**	**17.9**	**ug/L**	**89**		**SW846 8260B**
	20.0	**20.3**	**ug/L**	**102**	**13**	**SW846 8260B**
Toluene	**20.0**	**20.4**	**ug/L**	**102**		**SW846 8260B**
	20.0	**21.7**	**ug/L**	**108**	**6.3**	**SW846 8260B**
Trichloroethene	**20.0**	**18.7**	**ug/L**	**93**		**SW846 8260B**
	20.0	**20.1**	**ug/L**	**100**	**7.2**	**SW846 8260B**
Chlorobenzene	**20.0**	**20.3**	**ug/L**	**101**		**SW846 8260B**
	20.0	**22.0**	**ug/L**	**110**	**8.2**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	106	(70 - 130)
	109	(70 - 130)
1,2-Dichloroethane-d4	92	(70 - 130)
	93	(70 - 130)
Toluene-d8	109	(70 - 130)
	107	(70 - 130)
Dibromofluoromethane	99	(70 - 130)
	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM3AQ1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5J190000-302 HM3AQ1AD-LCSD
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292302
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**91**	**(80 - 120)**			**SW846 8260B**
	98	**(80 - 120)**	**7.8**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethene	**80**	**(80 - 120)**			**SW846 8260B**
	96	**(80 - 120)**	**18**	**(0-30)**	**SW846 8260B**
Toluene	**93**	**(80 - 120)**			**SW846 8260B**
	101	**(80 - 120)**	**8.6**	**(0-30)**	**SW846 8260B**
Trichloroethene	**90**	**(80 - 120)**			**SW846 8260B**
	100	**(80 - 120)**	**9.9**	**(0-30)**	**SW846 8260B**
Chlorobenzene	**96**	**(80 - 120)**			**SW846 8260B**
	100	**(80 - 120)**	**3.6**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	111	(70 - 130)
	116	(70 - 130)
1,2-Dichloroethane-d4	113	(70 - 130)
	117	(70 - 130)
Toluene-d8	117	(70 - 130)
	123	(70 - 130)
Dibromofluoromethane	114	(70 - 130)
	121	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM3AQ1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5J190000-302 HM3AQ1AD-LCSD
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292302
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**20.0**	**18.1**	**ug/L**	**91**		**SW846 8260B**
	20.0	**19.6**	**ug/L**	**98**	**7.8**	**SW846 8260B**
1,1-Dichloroethene	**20.0**	**15.9**	**ug/L**	**80**		**SW846 8260B**
	20.0	**19.1**	**ug/L**	**96**	**18**	**SW846 8260B**
Toluene	**20.0**	**18.5**	**ug/L**	**93**		**SW846 8260B**
	20.0	**20.2**	**ug/L**	**101**	**8.6**	**SW846 8260B**
Trichloroethene	**20.0**	**18.1**	**ug/L**	**90**		**SW846 8260B**
	20.0	**19.9**	**ug/L**	**100**	**9.9**	**SW846 8260B**
Chlorobenzene	**20.0**	**19.3**	**ug/L**	**96**		**SW846 8260B**
	20.0	**20.0**	**ug/L**	**100**	**3.6**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	111	(70 - 130)
	116	(70 - 130)
1,2-Dichloroethane-d4	113	(70 - 130)
	117	(70 - 130)
Toluene-d8	117	(70 - 130)
	123	(70 - 130)
Dibromofluoromethane	114	(70 - 130)
	121	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...:	G5J070276	**Work Order #...:**	HL9L81AC-MS	**Matrix.....:**	WG
MS Lot-Sample #:	G5J070276-007		HL9L81AD-MSD		
Date Sampled...:	10/03/05	**Date Received..:**	10/06/05		
Prep Date.....:	10/17/05	**Analysis Date..:**	10/17/05		
Prep Batch #...:	5291444				
Dilution Factor:	10				

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**108**	**(70 - 130)**			**SW846 8260B**
	110	**(70 - 130)**	**2.0**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethene	**123**	**(70 - 130)**			**SW846 8260B**
	124	**(70 - 130)**	**1.6**	**(0-30)**	**SW846 8260B**
Toluene	**114**	**(70 - 130)**			**SW846 8260B**
	116	**(70 - 130)**	**1.5**	**(0-30)**	**SW846 8260B**
Trichloroethene	**103**	**(70 - 130)**			**SW846 8260B**
	105	**(70 - 130)**	**0.75**	**(0-30)**	**SW846 8260B**
Chlorobenzene	**111**	**(70 - 130)**			**SW846 8260B**
	113	**(70 - 130)**	**2.2**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	104	(70 - 130)
	111	(70 - 130)
1,2-Dichloroethane-d4	85	(70 - 130)
	90	(70 - 130)
Toluene-d8	101	(70 - 130)
	104	(70 - 130)
Dibromofluoromethane	92	(70 - 130)
	96	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HL9L81AC-MS **Matrix.....:** WG
MS Lot-Sample #: G5J070276-007 HL9L81AD-MSD
Date Sampled...: 10/03/05 **Date Received..:** 10/06/05
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 10

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	**ND**	**200**	**215**	**ug/L**	**108**		**SW846 8260B**
	ND	**200**	**220**	**ug/L**	**110**	**2.0**	**SW846 8260B**
1,1-Dichloroethene	**ND**	**200**	**245**	**ug/L**	**123**		**SW846 8260B**
	ND	**200**	**249**	**ug/L**	**124**	**1.6**	**SW846 8260B**
Toluene	**ND**	**200**	**228**	**ug/L**	**114**		**SW846 8260B**
	ND	**200**	**232**	**ug/L**	**116**	**1.5**	**SW846 8260B**
Trichloroethene	**280**	**200**	**489**	**ug/L**	**103**		**SW846 8260B**
	280	**200**	**493**	**ug/L**	**105**	**0.75**	**SW846 8260B**
Chlorobenzene	**ND**	**200**	**222**	**ug/L**	**111**		**SW846 8260B**
	ND	**200**	**227**	**ug/L**	**113**	**2.2**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	104	(70 - 130)
	111	(70 - 130)
1,2-Dichloroethane-d4	85	(70 - 130)
	90	(70 - 130)
Toluene-d8	101	(70 - 130)
	104	(70 - 130)
Dibromofluoromethane	92	(70 - 130)
	96	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

AUTOMATED DATA REVIEW SUMMARY

Facility:	SWMU 58
Event:	2004_2005 SWMU 58 Phase II RFI GW
Contract:	9T9H213C
Sample Delivery Group:	G5J070276
Field Contractor:	Parsons Engineering Science, Salt Lake City
Laboratory Contractor:	SEVERN TRENT LABS., WEST SACRAMENTO, CA
Data Review Contractor:	Synectics, Sacramento, CA
Guidance Document:	*Final Phase II RCRA Facility Investigation SWMU-58 Workplan, December 2003*

Analytical Method	Normal Samples	Field QC Samples
SW8260B	18	2

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistant with the requirements contained in Final Phase II RCRA Facility Investigation SWMU-58 Workplan, December 2003 to the extent possible. Where definitive guidance is not provided, data has been evaluated in a conservative manner using professional judgment. In cases where two qualifiers are listed as an action, such as "J/UJ", the first qualifier applies to positive results, and the second to non-detect results.

Samples were collected by Parsons Engineering Science, Salt Lake City; analyses were performed by SEVERN TRENT LABS., WEST SACRAMENTO, CA and were reported under sample delivery group (SDG) G5J070276. Results have been evaluated electronically using electronic data deliverables (EDDs) provided by the laboratory. The laboratory data summary forms (hard copy) have been reviewed during this effort and compared to the automated review output. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative. The following quality control elements were evaluated during this review effort:

Technical Holding Times
Continuing Calibration Verification
Method Blank Contamination
Field Blank Contamination
Blank Spike Accuracy
Blank Spike Precision
Matrix Spike Accuracy
Matrix Spike Precision
Surrogate Recovery
Laboratory Duplicate Precision
Field Duplicate Precision

A minimum of ten percent of sample and QC results were manually evaluated for compliance with project specific requirements and consistency with hard copy results. The following reports were generated during the evaluation of this data set and are presented as attachments to this report as applicable.

Data Submission Warnings – Warnings encountered during the data submission process are evaluated and their affect on data quality is discussed in the narrative.

Batch – The analytical batch report is reviewed for completeness and compliance with project specific requirements. Incomplete or non-compliant run sequences are identified and their impact on data quality are discussed in the narrative.

QC Outlier – Results exceeding the evaluation criteria are reviewed for compliance with project requirements and a minimum of ten percent of the non-compliant QC values reported electronically are verified for consistency with hard-copy values.

Qualified Results – Qualified results are evaluated for compliance with project requirements and ten percent of qualified results are verified for consistency with the QC Outlier Report.

Field Duplicate – Field duplicate comparison results are evaluated for compliance with project requirements and ten percent of values reported are verified for consistency with the hard-copy data.

Rejected Results – All rejected results are evaluated for compliance with project requirements. The reason for rejection of the data is verified against hard copy data.

Analytical deficiencies, project non-compliance issues and inconsistencies with hard copy results observed during ADR evaluation process and their impact on data quality are summarized in the ADR narrative.

Out of control events experienced by the laboratory have warranted the qualification of 2.6% (11 results) and the rejection of 0 % (0 results) of the data set. These deficiencies are detailed in the referenced attachments, and discussed in the ADR narrative, where appropriate.

Released by

Date

Reason and Comment Codes

Code	Definition
C1	Diluted Out
C2	Flag Parent Only
C2S	Flag Parent (Soil); Batch (Water)
C3	No Action
C4	No QC Outliers
C5	One or both values <5x RL
C6	Recalculated Value
C7	Material Blanks
C8	Spike Insignificant
C9	No Flags; set to ND by method/cal. blank

Reasons

Code	Definition
A	Serial dilution
B	Calibration Blank - Negative
	Negative Blank
B1	Blank
B2	Calibration Blank
C	Continuing Calibration Verification
	Continuing Calibration Verification RRF
D	BS RPD
	Field Duplicate RPD
D1	Lab Replicate RPD
D2	MS RPD
E	Exceeds LinearCalibration Range
F	Hydrocarbon pattern does not match standard
G	Initial Calibration RRF
	Initial Calibration RSD
H	Test Hold Time
	Prep Hold Time
I	Internal standard
K1	Equip Blank
K2	Field Blank
K3	Trip Blank
L	LCS Recovery
M	MS Recovery
N	Blank - No Action
O	Interference check sample
P	Column RPD
Q	Material Blank
S	Surrogate
T	Receipt Temperature
TI	Tentatively Identified Compound
TR	Trace Level Detect
W	Column breakdown (pesticides)
X	Raised reporting limit
Y	Analyte not confirmed on second column

ADR CASE NARRATIVE

Laboratory ID: G5J070276

Prior to loading and processing data, modifications to the project setup may be requested by the laboratory and/or contractor, and approved by the client. These modifications allow the loading of data that was not in complete agreement with the project guidance document; in some cases, variances to the project document may be in process, in others, the changes are required to accept data that had not been generated in compliance with the project guidance document. All project setup modifications are listed below:

There were no project setup modifications associated with this sample delivery group.

Chemistry Data Quality

The data submission process incorporates a series of stored procedures designed to identify conditions in electronic data deliverables (EDD) that would affect chemistry data quality. These conditions will not result in the qualification of the data; however, these findings should be reviewed for possible contractual non-compliance. A brief explanation of each finding encountered for this data set and the potential impact on chemistry data quality is summarized below.

There were no issues affecting chemistry data quality associated with this sample delivery group.

Data Verification

The data verification process includes a manual review of information on the chains of custody and laboratory case narratives, a check of all rejected results and a minimum of 10 percent of sample and QC results for consistency with hard copy reports, and a cursory review of all reports generated during the automated review process. The following comments are associated with the verification process:

1. **Volatiles by SW8260**

   An matrix spike (MS) was not provided on the EDD for the analytical batch for this SDG. No qualifiers have been applied on this basis.

   It was noted that the data flagging system could not determine the hold times for the reanalysis of samples C-45FD001, C-45GW002, C-45GW003, C-48FGW001, C-48FGW002, C-48FGW003, and C-48FGW004 due to 2 sets of surrogates being provided for the same samples. The data was manually reviewed and the reanalysis were found to be outside project warning limits. TCE was flagged as estimated as seen in the Qualified Results report.

All of the reports utilized during the data verification process are provided as attachments to this report.

Batch Report

Facility: SWMU 58
Lab: SVLS
Filename: G5J070276
Status: Certified - 12/12/2005
User: BonnieMcNeill

Test Method: SW8260B
Leach Method: NONE

Test Batch	Prep Batch	Leach Batch	Location	Matrix	Field Sample ID	Lab Sample ID	Test Date and Time	Sample Type
HP101018	NA	NA	LABQC	WQ		HSL020	10/18/2005 1:56:00PM	CV6
	5292302	NA	LABQC	WQ		G5J190000302	10/18/2005 3:31:00PM	BS1
	5292302	NA	LABQC	WQ		G5J190000302	10/18/2005 4:13:00PM	BD1
	5292302	NA	LABQC	WQ		G5J190000302	10/18/2005 5:14:00PM	LB1
	5292302	NA	D-18	WG	D-18GW009	G5J070276016	10/18/2005 5:48:00PM	N1
	5292302	NA	D-18	WG	D-18GW010	G5J070276017	10/18/2005 6:13:00PM	N1
	5292302	NA	D-18	WG	D-18GW011	G5J070276018	10/18/2005 6:37:00PM	N1
	5292302	NA	D-18	WG	D-18GW012	G5J070276019	10/18/2005 7:02:00PM	N1
HP71014	NA	NA	LABQC	WQ		LCS SS	10/14/2005 5:57:00PM	CV1
	NA	NA	LABQC	WQ		LCS SS	10/14/2005 5:57:00PM	CV3
HP71020	NA	NA	LABQC	WQ		HSL020	10/20/2005 11:23:00AM	CV2
	NA	NA	LABQC	WQ		HSL020	10/20/2005 11:23:00AM	CV7
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 11:56:00AM	BS1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 11:56:00AM	BS1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:24:00PM	BD1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:24:00PM	BD1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:52:00PM	LB1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:52:00PM	LB1
	5340483	NA	C-45	WG	C-45FD001	G5J070276006	10/20/2005 1:47:00PM	FD1
	5340483	NA	C-45	WG	C-45GW002	G5J070276008	10/20/2005 2:15:00PM	N1
	5340483	NA	C-45	WG	C-45GW003	G5J070276009	10/20/2005 2:43:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW004	G5J070276013	10/20/2005 3:11:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW001	G5J070276010	10/20/2005 3:38:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW002	G5J070276011	10/20/2005 4:06:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW003	G5J070276012	10/20/2005 4:34:00PM	N1
HP91006	NA	NA	LABQC	WQ		LCS/SS	10/6/2005 6:22:00PM	CV1
	NA	NA	LABQC	WQ		LCS/SS	10/6/2005 6:45:00PM	CV2

Batch Report

Facility: SWMU 58
Lab: SVLS
Filename: G5J070276
Status: Certified - 12/12/2005
User: BonnieMcNeill

Test Method: SW8260B
Leach Method: NONE

Test Batch	Prep Batch	Leach Batch	Location	Matrix	Field Sample ID	Lab Sample ID	Test Date and Time	Sample Type
HP91017	NA	NA	LABQC	WQ		HSL020	10/17/2005 12:00:00PM	CV4
	5291444	NA	LABQC	WQ		G5J180000444	10/17/2005 12:36:00PM	BS1
	5291444	NA	C-45	WG	C-45GW001	G5J070276007	10/17/2005 2:49:00PM	MS1
	5291444	NA	C-45	WG	C-45GW001	G5J070276007	10/17/2005 3:12:00PM	SD1
	5291444	NA	LABQC	WQ		G5J180000444	10/17/2005 3:58:00PM	LB1
	5291444	NA	C-45	WG	C-45GW001	G5J070276007	10/17/2005 4:20:00PM	N1
	5291444	NA	C-45	WG	C-45FD001	G5J070276006	10/17/2005 4:43:00PM	FD1
	5291444	NA	C-45	WG	C-45GW002	G5J070276008	10/17/2005 5:06:00PM	N1
	5291444	NA	C-45	WG	C-45GW003	G5J070276009	10/17/2005 5:29:00PM	N1
	5291444	NA	FIELDQC	WQ	PARSTB12	G5J070276020	10/17/2005 5:52:00PM	TB1
	5340483	NA	C-45	WG	C-45FD001	G5J070276006	10/20/2005 1:47:00PM	FD1
	5340483	NA	C-45	WG	C-45GW002	G5J070276008	10/20/2005 2:15:00PM	N1
	5340483	NA	C-45	WG	C-45GW003	G5J070276009	10/20/2005 2:43:00PM	N1
HP91018	NA	NA	LABQC	WQ		HSL020	10/18/2005 10:46:00AM	CV5
	5292173	NA	LABQC	WQ		G5J190000173	10/18/2005 11:20:00AM	BS1
	5292173	NA	LABQC	WQ		G5J190000173	10/18/2005 11:57:00AM	BD1
	5292173	NA	LABQC	WQ		G5J190000173	10/18/2005 12:43:00PM	LB1
	5292173	NA	D-19	WG	D-19FD001	G5J070276001	10/18/2005 4:46:00PM	N1
	5292173	NA	D-19	WG	D-19GW001	G5J070276002	10/18/2005 5:09:00PM	N1
	5292173	NA	D-19	WG	D-19GW002	G5J070276003	10/18/2005 5:32:00PM	N1
	5292173	NA	D-19	WG	D-19GW003	G5J070276004	10/18/2005 5:55:00PM	N1
	5292173	NA	D-17	WG	D-17GW001	G5J070276005	10/18/2005 6:18:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW001	G5J070276010	10/18/2005 6:41:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW002	G5J070276011	10/18/2005 7:03:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW003	G5J070276012	10/18/2005 7:27:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW004	G5J070276013	10/18/2005 7:49:00PM	N1
	5292173	NA	D-18	WG	D-18GW007	G5J070276014	10/18/2005 8:12:00PM	N1

Batch Report

Facility: SWMU 58
Lab: SVLS
Filename: G5J070276
Status: Certified - 12/12/2005
User: BonnieMcNeill

Test Method: SW8260B
Leach Method: NONE

Test Batch	Prep Batch	Leach Batch	Location	Matrix	Field Sample ID	Lab Sample ID	Test Date and Time	Sample Type
HP91018	5292173	NA	D-18	WG	D-18GW008	G5J070276015	10/18/2005 8:35:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW004	G5J070276013	10/20/2005 3:11:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW001	G5J070276010	10/20/2005 3:38:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW002	G5J070276011	10/20/2005 4:06:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW003	G5J070276012	10/20/2005 4:34:00PM	N1

QC Outliers

Facility: SWMU 58
Event: 2004_2005 SWMU 58 Phase II RFI GW
Reference: 9T9H213C

SDG G5J070276

Test/Leach	QCElement	Sample	Type	Dil'n	Analyte	Result	Units	Warning Limits	Control Limits	Qualifier	Reason	Cmnt.
SW8260B/NONE	Fld. RPD	C-45FD001	FD1	10.00	Trichloroethene (TCE)	38	RPD	<25	< 25	None	D	C2
SW8260B/NONE	LCS %R	P5292302LABQC	BS1	1.00	1,1-Dichloroethene	80	%	80 - 120	10 - 120	J / UJ	L	

Detected Results

Facility: SWMU 58
Event: 2004_2005 SWMU 58 Phase II RFI GW
Reference: ISSS-539-01

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result		Qualified Result		Units	Reason
SW8260B/NONE	WG	C-45FD001	FD	Carbon Tetrachloride	1.0	3.4		3.4		UG/L	
SW8260B/NONE	WG	C-45FD001	FD	Chloroform	1.0	0.32	J	0.32	J	UG/L	TR
SW8260B/NONE	WG	C-45FD001	FD	Trichloroethene (TCE)	10	190		190	J	UG/L	H
SW8260B/NONE	WG	C-45GW001	N	Carbon Tetrachloride	10	3.4	J	3.4	J	UG/L	TR
SW8260B/NONE	WG	C-45GW001	N	Trichloroethene (TCE)	10	280		280		UG/L	
SW8260B/NONE	WG	C-45GW002	N	Carbon Tetrachloride	1.0	3.2		3.2		UG/L	
SW8260B/NONE	WG	C-45GW002	N	Chloroform	1.0	0.35	J	0.35	J	UG/L	TR
SW8260B/NONE	WG	C-45GW002	N	Trichloroethene (TCE)	10	200		200	J	UG/L	H
SW8260B/NONE	WG	C-45GW003	N	Carbon Tetrachloride	1.0	3.0		3.0		UG/L	
SW8260B/NONE	WG	C-45GW003	N	Chloroform	1.0	0.29	J	0.29	J	UG/L	TR
SW8260B/NONE	WG	C-45GW003	N	Trichloroethene (TCE)	10	180		180	J	UG/L	H
SW8260B/NONE	WG	C-48FGW001	N	1,1-Dichloroethene	1.0	1.2		1.2		UG/L	
SW8260B/NONE	WG	C-48FGW001	N	Carbon Tetrachloride	1.0	0.39	J	0.39	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Chloroform	1.0	0.63	J	0.63	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	cis-1,2-Dichloroethylene	1.0	0.10	J	0.10	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Trichloroethene (TCE)	20	360		360	J	UG/L	H
SW8260B/NONE	WG	C-48FGW002	N	1,1-Dichloroethene	1.0	1.1		1.1		UG/L	
SW8260B/NONE	WG	C-48FGW002	N	Carbon Tetrachloride	1.0	0.44	J	0.44	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Chloroform	1.0	0.48	J	0.48	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Trichloroethene (TCE)	20	340		340	J	UG/L	H
SW8260B/NONE	WG	C-48FGW003	N	1,1-Dichloroethene	1.0	1.1		1.1		UG/L	
SW8260B/NONE	WG	C-48FGW003	N	Carbon Tetrachloride	1.0	0.33	J	0.33	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Chloroform	1.0	0.50	J	0.50	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	cis-1,2-Dichloroethylene	1.0	0.12	J	0.12	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Trichloroethene (TCE)	20	320		320	J	UG/L	H
SW8260B/NONE	WG	C-48FGW004	N	1,1-Dichloroethane	1.0	0.13	J	0.13	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	1,1-Dichloroethene	1.0	1.2		1.2		UG/L	

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result		Qualified Result		Units	Reason
SW8260B/NONE	WG	C-48FGW004	N	Carbon Tetrachloride	1.0	0.36	J	0.36	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Chloroform	1.0	0.56	J	0.56	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	cis-1,2-Dichloroethylene	1.0	0.18	J	0.18	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Trichloroethene (TCE)	10	300		300	J	UG/L	H
SW8260B/NONE	WG	D-17GW001	N	Carbon Tetrachloride	1.0	0.43	J	0.43	J	UG/L	TR
SW8260B/NONE	WG	D-17GW001	N	Chloroform	1.0	0.18	J	0.18	J	UG/L	TR
SW8260B/NONE	WG	D-17GW001	N	Trichloroethene (TCE)	1.0	3.8		3.8		UG/L	
SW8260B/NONE	WG	D-18GW007	N	Trichloroethene (TCE)	1.0	5.0		5.0		UG/L	
SW8260B/NONE	WG	D-18GW008	N	Trichloroethene (TCE)	1.0	4.4		4.4		UG/L	
SW8260B/NONE	WG	D-18GW009	N	Carbon Tetrachloride	1.0	0.15	J	0.15	J	UG/L	TR
SW8260B/NONE	WG	D-18GW009	N	Trichloroethene (TCE)	1.0	3.9		3.9		UG/L	
SW8260B/NONE	WG	D-18GW010	N	Trichloroethene (TCE)	1.0	3.7		3.7		UG/L	
SW8260B/NONE	WG	D-18GW011	N	Carbon Tetrachloride	1.0	0.16	J	0.16	J	UG/L	TR
SW8260B/NONE	WG	D-18GW011	N	Trichloroethene (TCE)	1.0	3.8		3.8		UG/L	
SW8260B/NONE	WG	D-18GW012	N	Trichloroethene (TCE)	1.0	3.8		3.8		UG/L	
SW8260B/NONE	WG	D-19FD001	N	Carbon Tetrachloride	1.0	0.66	J	0.66	J	UG/L	TR
SW8260B/NONE	WG	D-19FD001	N	Chloroform	1.0	0.22	J	0.22	J	UG/L	TR
SW8260B/NONE	WG	D-19FD001	N	Trichloroethene (TCE)	1.0	5.9		5.9		UG/L	
SW8260B/NONE	WG	D-19GW001	N	Carbon Tetrachloride	1.0	0.57	J	0.57	J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Chloroform	1.0	0.25	J	0.25	J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Trichloroethene (TCE)	1.0	6.0		6.0		UG/L	
SW8260B/NONE	WG	D-19GW002	N	Carbon Tetrachloride	1.0	0.76	J	0.76	J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Chloroform	1.0	0.20	J	0.20	J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Trichloroethene (TCE)	1.0	6.3		6.3		UG/L	
SW8260B/NONE	WG	D-19GW003	N	Carbon Tetrachloride	1.0	0.73	J	0.73	J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Chloroform	1.0	0.23	J	0.23	J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Trichloroethene (TCE)	1.0	6.6		6.6		UG/L	

Qualified Results

Facility: SWMU 58
Event: 2004_2005 SWMU 58 Phase II RFI GW
Reference: ISSS-539-01

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result		Qualified Result		Units	Reason
SW8260B/NONE	WG	C-45FD001	FD	Chloroform	1.0	0.32	J	0.32	J	UG/L	TR
SW8260B/NONE	WG	C-45FD001	FD	Trichloroethene (TCE)	10	190		190	J	UG/L	H
SW8260B/NONE	WG	C-45GW001	N	Carbon Tetrachloride	10	3.4	J	3.4	J	UG/L	TR
SW8260B/NONE	WG	C-45GW002	N	Chloroform	1.0	0.35	J	0.35	J	UG/L	TR
SW8260B/NONE	WG	C-45GW002	N	Trichloroethene (TCE)	10	200		200	J	UG/L	H
SW8260B/NONE	WG	C-45GW003	N	Chloroform	1.0	0.29	J	0.29	J	UG/L	TR
SW8260B/NONE	WG	C-45GW003	N	Trichloroethene (TCE)	10	180		180	J	UG/L	H
SW8260B/NONE	WG	C-48FGW001	N	Carbon Tetrachloride	1.0	0.39	J	0.39	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Chloroform	1.0	0.63	J	0.63	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	cis-1,2-Dichloroethylene	1.0	0.10	J	0.10	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Trichloroethene (TCE)	20	360		360	J	UG/L	H
SW8260B/NONE	WG	C-48FGW002	N	Carbon Tetrachloride	1.0	0.44	J	0.44	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Chloroform	1.0	0.48	J	0.48	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Trichloroethene (TCE)	20	340		340	J	UG/L	H
SW8260B/NONE	WG	C-48FGW003	N	Carbon Tetrachloride	1.0	0.33	J	0.33	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Chloroform	1.0	0.50	J	0.50	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	cis-1,2-Dichloroethylene	1.0	0.12	J	0.12	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Trichloroethene (TCE)	20	320		320	J	UG/L	H
SW8260B/NONE	WG	C-48FGW004	N	1,1-Dichloroethane	1.0	0.13	J	0.13	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Carbon Tetrachloride	1.0	0.36	J	0.36	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Chloroform	1.0	0.56	J	0.56	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	cis-1,2-Dichloroethylene	1.0	0.18	J	0.18	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Trichloroethene (TCE)	10	300		300	J	UG/L	H
SW8260B/NONE	WG	D-17GW001	N	Carbon Tetrachloride	1.0	0.43	J	0.43	J	UG/L	TR
SW8260B/NONE	WG	D-17GW001	N	Chloroform	1.0	0.18	J	0.18	J	UG/L	TR
SW8260B/NONE	WG	D-18GW009	N	1,1-Dichloroethene	1.0	1.0	U	1.0	UJ	UG/L	L
SW8260B/NONE	WG	D-18GW009	N	Carbon Tetrachloride	1.0	0.15	J	0.15	J	UG/L	TR

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result		Qualified Result		Units	Reason
SW8260B/NONE	WG	D-18GW010	N	1,1-Dichloroethene	1.0	1.0	U	1.0	UJ	UG/L	L
SW8260B/NONE	WG	D-18GW011	N	1,1-Dichloroethene	1.0	1.0	U	1.0	UJ	UG/L	L
SW8260B/NONE	WG	D-18GW011	N	Carbon Tetrachloride	1.0	0.16	J	0.16	J	UG/L	TR
SW8260B/NONE	WG	D-18GW012	N	1,1-Dichloroethene	1.0	1.0	U	1.0	UJ	UG/L	L
SW8260B/NONE	WG	D-19FD001	N	Carbon Tetrachloride	1.0	0.66	J	0.66	J	UG/L	TR
SW8260B/NONE	WG	D-19FD001	N	Chloroform	1.0	0.22	J	0.22	J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Carbon Tetrachloride	1.0	0.57	J	0.57	J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Chloroform	1.0	0.25	J	0.25	J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Carbon Tetrachloride	1.0	0.76	J	0.76	J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Chloroform	1.0	0.20	J	0.20	J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Carbon Tetrachloride	1.0	0.73	J	0.73	J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Chloroform	1.0	0.23	J	0.23	J	UG/L	TR

DATA MANAGEMENT NARRATIVE

Laboratory ID: G5J070276

Data Submission

The data submission process incorporates a series of stored procedures designed to identify valid value (VVL), logical (LE), and project specific errors (PSE) in electronic data deliverables (EDD). Automated data review (ADR) is most efficient when data generators correct all errors. Dependent primarily upon the electronic reporting capabilities of the data generator, the severity of the logical and project specific errors listed below have been reduced to warnings. A warning log is generated with each data submission and is presented as an attachment to this report. A brief explanation of each error encountered for this data set and the potential impact on data quality is summarized below.

1. **Logical Error (LE) spLE01_ANADATE_Unique**
   This logical error occurs when multiple analyses are submitted within the same analytical batch that have identical analysis dates and times. This occurs in the laboratory when instruments are able to perform analyses in less than one minute, as ERPIMS specification records time only to the minute. However, it can also occur if the time of analysis is not recorded by an instrument, and the laboratory analyst reports all measurements in a batch with the same time. Whenever possible, actual times of analysis should be recorded and reported.

2. **Project Specific Error (PSE) spPSE01L_Invalid_Units_QC**
   This PSE occurs when laboratory quality control samples are reported with units of percent as opposed to true values. This inconsistency does not affect data quality, unless the submittal is scheduled for delivery to the AFCEE in accordance with the ERPIMS 4.0 specification. Automated data review can be performed for laboratory QC when units are reported in percent or in concentration units. However, to avoid this warning on future submittals, the laboratory would need to report these values in units of concentration (i.e., ug/L).

3. **Logical Error (LE) spLE01_QAPPFLAGS_F**
   This LE warning occurs when there are positive results less than the RL and associated QAPPFLAGS are not “F”. This requirement is only necessary if the project is an AFCEE project or if the data is to be submitted to ERPIMS. To avoid this warning in the future, apply QAPPFLAGS of “F” whenever the detected result is less than the RL.

4. **Valid Value List (VVL) spVVL32_LABLOTCTL**
   This warning occurs when the laboratory does not include the preparation batch number (LABLOTCTL). The LABLOTCTL field should be populated with the same ID for all field and QC samples extracted/prepared in the same batch. To avoid this warning on future submittals, populate the LABLOTCTL field.

5. **Valid Value List (VVL) spVVL33_CALREFID**
   This valid value warning occurs when the laboratory does not include the calibration reference ID (CALREFID). To avoid this warning in the future, the laboratory should include the CALREFID on the electronic data.

6. **Valid Value List (VVL) spVVL56_QAPPFLAGS**
   This valid value warning occurs when there are QAPPFLAGS in the file that are not official AFCEE qualifiers. Using the official AFCEE qualifiers is necessary only if the project is an AFCEE project or if the data is to be submitted to ERPIMS. To avoid this warning in the future, apply only AFCEE qualifiers to the QAPPFLAGS field.

A detailed description of the stored procedures utilized during the data submission process is provided as an attachment to this report (Submission Warnings).

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J070276\G5J070276.txt

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LE

Query Name	Finding	Record Count
spLE01_ANADATE_Unique	ANMCODE is SW8260B; ANADATE is Oct 20 2005 11:23AM; ANALOT is HP71020	2
	ANMCODE is SW8260B; ANADATE is Oct 14 2005 5:57PM; ANALOT is HP71014	2

PSE

Query Name	Finding	Record Count
spPSE01L_Invalid_Units_QC	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is N/STD; UNITS is percent	87
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is BD/STD; UNITS is percent	9
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is MS/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is FD/STD; UNITS is percent	12
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is SD/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is CV/ORG; UNITS is PERCENT	106
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is CV/STD; UNITS is percent	27
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is BS/STD; UNITS is percent	12
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is TB/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is LB/STD; UNITS is percent	12

VVL

Query Name	Finding	Record Count
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.3300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 3.4000; RL is 10.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1200; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5600; RL is 1.0000; QAPPFLAGS is J	1

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J070276\G5J070276.txt

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VVL

Query Name	Finding	Record Count
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.1500; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3500; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3900; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.7600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2900; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.6600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3200; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.4300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.7300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2500; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5000; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5700; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.6300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1000; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.4800; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2000; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2200; RL is 1.0000; QAPPFLAGS is J	1

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J070276\G5J070276.txt

VVL

Query Name	Finding	Record Count
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.1800; RL is 1.0000; QAPPFLAGS is J	2
	PARVQ is TR; PARVAL is 0.4400; RL is 1.0000; QAPPFLAGS is J	1
spVVL32_LABLOTCTL	LABLOTCTL is Null	133
spVVL33_CALREFID	CALREFID is Null	655
spVVL56_QAPPFLAGS	QAPPFLAGS is Uq	1

Total Record Count: 788
Error Count: 0
Warning Count: 1,103

APPENDIX G

PARSONS

406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069

Memorandum

To: Dean Reynolds, TEAD; Larry McFarland, TEAD

Copy: Maryellen Mackenzie, USACE; Carl Cole, USACE; Doug Mackenzie, USACE; Richard Jirik, Parsons; Kurt Alloway, Parsons

From: Amanda Evans, Parsons

Date: Tuesday, August 2, 2005

Subject: TEAD SWMU-58 RFI – Waste Management

This letter is to recommend disposition of the waste soil in PARSNZ0519501 , PARSNZ0519502, PARSNZ0519503, PA RSNZ0519504, PARSNZ0519505, and PARSN0519506 in six 55 gallon drums as detailed in Table One, attached. The waste was generated in association with well D-19.

The soils were sampled as IDW56 and tested for TCLP VOCs. Analysis was conducted by Severn Trent Services, Inc, West Sacramento, CA. This laboratory is Utah Certified.

Results have been received as an analytical report and quality control (QC) summary. Parsons has reviewed the data and found the QC to be acceptable. The complete report is attached.

Listed Wastes Analysis:

No constituents were detected.

Therefore it is recommended that waste be treated as non-hazardous with respect to listed codes.

Characteristic Wastes Analysis:

The waste is known to be primarily soil. Therefore generator's reasonable knowledge may be used to exclude the characteristics of ignitability, reactivity and corrosivity.

No constituents were detected. Therefore no characteristic waste codes (40 CFR Part 261.24) should be applied.

Land Disposal Restrictions Analysis:

No constituents were detected (40 CFR Part 268.48), therefore LDRs do not apply.

{

Disposition:

Recommendations for disposal of the soil are to dispose at the drill site from which the soil originated on the ground around the monitoring well. Parsons will arrange to dispose of the waste per your written instructions.

Table One

ContainerID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	DispositionDate
PARSNZ051950_1	KLA	YES		55 GAL	D-19	SOIL	7/14/2005	7/14/2005	7/14/2005	10/2/2005			

Sites	Location	Move Date	Manifest ID	Manifest Date
D-19	D-19	7/14/2005		
	UID-90	7/14/2005	P5009	7/14/2005

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	DispositionDate
PARSNZ051950_2	KLA	YES		55 GAL	D-19	SOIL	7/14/2005	7/14/2005	7/14/2005	10/2/2005			

Sites	Location	Move Date	Manifest ID	Manifest Date
D-19	UID-90	7/14/2005	P5009	7/14/2005
	D-19	7/14/2005		

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	DispositionDate
PARSNZ051950_3	KLA	YES		55 GAL	D-19	SOIL	7/14/2005	7/14/2005	7/14/2005	10/2/2005			

Sites	Location	Move Date	Manifest ID	Manifest Date
D-19	D-19	7/14/2005		
	UID-90	7/14/2005	P5009	7/14/2005

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	DispositionDate
PARSNZ051950_4	KLA	YES		55 GAL	D-19	SOIL	7/14/2005	7/14/2005	7/14/2005	10/2/2005			

Sites	Location	Move Date	Manifest ID	Manifest Date
D-19	UID-90	7/14/2005	P5009	7/14/2005
	D-19	7/14/2005		

ContainerID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	DispositionDate
PARSNZ051950_5	KLA	YES		55 GAL	D-19	SOIL	7/14/2005	7/14/2005	7/14/2005	10/2/2005			

Site	Location	Move Date	Manifest ID	Manifest Date
D-19	UID-90	7/14/2005	PS009	7/14/2005
	D-19	7/14/2005		

ContainerID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	DispositionDate
PARSNZ051950_6	KLA	YES		55 GAL	D-19	SOIL	7/14/2005	7/14/2005	7/14/2005	10/2/2005			

Site	Location	Move Date	Manifest ID	Manifest Date
D-19	D-19	7/14/2005		
	UID-90	7/14/2005	PS009	7/14/2005

Robert Ivers - FW: TEAD Investigative Derived Waste Disposal

From: "McFarland, Larry" <larry.mcfarland@us.army.mil>
To: "Matt Ivers (Kleinfelder)" <rivers@kleinfelder.com>
Date: 12/1/2005 3:21 PM
Subject: FW: TEAD Investigative Derived Waste Disposal

-----Original Message-----
From: McFarland, Larry
Sent: Tuesday, August 02, 2005 4:23 PM
To: Evans, Amanda (Parsons)
Cc: Alloway, Kurt; Jirik, Richard (Parsons); Reynolds, Dean (Environmental)
Subject: TEAD Investigative Derived Waste Disposal

The Tooele Army Depot (TEAD) Environmental Office has reviewed your memorandum dated August 2, 2005 concerning the recommended disposition of Investigative Derived Waste (IDW) which has been characterized for disposal through sample number IDW56. TEAD concurs with Parsons recommended disposition. Based on the analysis provided, the soil cuttings contained in the following containers should be returned to the point of generation (monitoring well D-19), and spread on the surface surrounding the monitoring well.

PARSNZ0519501
PARSNZ0519502
PARSNZ0519503
PARSNZ0519504
PARSNZ0519505
PARSNZ0519506

Larry McFarland
Environmental Office, SJMTE-CS-EO
1 Tooele Army Depot, Building 8
Tooele, Utah 84074-5003
Phone (435) 833-3235 Fax (435) 833-2839
larry.mcfarland@us.army.mil
mcfarlal@emh2.tooele.army.mil

SEVERN TRENT STL

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

July 28, 2005

STL SACRAMENTO PROJECT NUMBER: G5G200173
PO/CONTRACT: 744139-30012

Jan Barbas
Parsons
406 West South Jordan Parkway
Suite 300
South Jordan, UT 84095

Dear Mr. Barbas,

This report contains the analytical results for the sample received under chain of custody by STL Sacramento on July 20, 2005. This sample is associated with your Tooelle Industrial Area project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

Preliminary results were provided on July 28, 2005.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

Nilo Ligi
Project Manager

TABLE OF CONTENTS

STL SACRAMENTO PROJECT NUMBER G5G200173

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5G200173

General Comments

Sample: 1

Samples were received in good condition at STL Sacramento at 3 degrees C. Sample was shipped to STL North Canton where it was received on 7/21/05 at 4.1 degrees C.

Sample labeled D-19, COC lists IDW 56.

SOLID, SW 1311/8260B, TCLP/Volatile Organics

Sample(s): 1

Samples were analysed by method SW 1311/8260B, a TCLP extraction followed by gas chromatography/mass spectrometry (GCMS) analysis. All QA/QC criteria were met.

There were no other anomalies associated with this project.

SEVERN TRENT STL

ACCREDITED IN ACCORDANCE WITH nelac

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California*	01119CA	Texas	TX 270-2004A
Colorado	NA	Utah*	QUAN1
Connecticut	PH-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	9930C, 334
Hawaii	NA	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary
G5G200173

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
HFV09	1	IDW56	7/19/2005 02:10 PM	7/20/2005 09:00 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

G5G200173

CHAIN OF CUSTODY

PARSONS

COC ID: 984

Project Name:	Tooele Industrial Area	Contractor:	Parsons-SLC
Project Manager:	Ed Stiles	Installation:	TEAD
Sample Coordinator:	Kurt Alloway	Sample Program:	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	IDW66	IDW66	SD	G	N	1	19 Jul 2005	1410	KLA	0	170	2

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
TCLPVOC	SVLS					

Remarks: D-19
PARSN205195O1-06

labeled D-19
on 7-20-05

5 DAY TURN AROUND REQUESTED

CN

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
[signature] TO FED EX	19 JUL 05 / 1600	[signature]	7/20/05 0925

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600 Tuesday, July 19, 2005 Page 1 of 1

STL-Sacramento (916) 373-5600

4 of 13

SEVERN TRENT **STL**

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Parsons PM NV LOG # 33613

LOT# (QUANTIMS ID) G5G200173 QUOTE# 62837 LOCATION NC

	Initials	Date
DATE RECEIVED 7/20/05 TIME RECEIVED 0900	CV	7/20/05

DELIVERED BY ☑ FEDEX ☐ CA OVERNIGHT ☐ CLIENT
☐ AIRBORNE ☐ GOLDENSTATE ☐ DHL
☐ UPS ☐ BAX GLOBAL ☐ GO-GETTERS
☐ STL COURIER ☐ COURIERS ON DEMAND
☐ OTHER

CUSTODY SEAL STATUS ☑ INTACT ☐ BROKEN ☐ N/A

CUSTODY SEAL #(S) Seal

SHIPPPING CONTAINER(S) ☐ STL ☑ CLIENT ☐ N/A

TEMPERTURE RECORD (IN °C) IR 1☐ 3☑ ☐ OTHER

COC #(S) 784

TEMPERATURE BLANK Observed: N/A Corrected: N/A

SAMPLE TEMPERATURE
Observed: 2 4 Average: 3 Corrected Average: 3

COLLECTOR'S NAME: ☑ Verified from COC ☐ Not on COC

pH MEASURED ☐ YES ☐ ANOMALY ☑ N/A

LABELED BY

LABELS CHECKED BY AA

PEER REVIEW ☑ NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING
WETCHEM ☑ N/A
VOA-ENCORES ☑ N/A

☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☑ N/A

☑ 7-20-05 COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES ☐ N/A

☑ Clouseau ☐ TEMPERATURE EXCEEDED (2 °C – 6 °C)*1 ☑ N/A

☐ WET ICE ☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED ☑ PM NOTIFIED

Notes: labeled D-19, COC list + IDW56

*1 Acceptable temperature range for State of Wisconsin samples is ≤ 4°C.

G5G200173 LEAVE NO SPACES BLANK. USE "N/A" IF NOT APPLICABLE. INITIAL AND DATE ALL "N/A" ENTRIES.

Severn Trent Laboratories, Inc
SAMPLE ANALYSIS REQUISITION

LABORATORY: STL N Canton
4101 Shuffel Drive NW
North Canton OH 44720,

NEED ANALYTICAL REPORT BY
7/24/05

VAMS 7/21/05.

ATTN:

C154 MMB 9w 7/21/05

LAB PURCHASE ORDER: SR070751

CLIENT CODE: 368391 PROJECT MANAGER: Nilo Ligi

NUMBER OF SAMPLES IN LOT: 0001

SAMPLE I.D.	SAMPLING DATE	ANALYSIS REQUIRED
G5G200173-001	7/19/05	Volatile Organics, GC/MS (8260B)
HFV09-1-AA		(MS8260TP) METHOD: 8260B

2x250

NEED DETECTION LIMIT AND ANALYSIS DATE INCLUDED IN REPORT.

SHIPPING METHOD: FEDEX DATE: 7/20/05

SEND REPORT TO: NILO LIGI

SAMPLE RECEIVED BY: _____ DATE: _____

PLEASE SEND A SIGNED COPY OF THIS FORM WITH REPORT AT COMPLETION OF ANALYSIS.

THANK YOU.

STL Sacramento
INT: _____ 7/20/05 11:19:43
STL N Canton
4101 Shuffel Drive NW
North Canton OH 44720,

RELINQUISHED BY: [signature] DATE/TIME: 7.20.05 15:00

RELINQUISHED BY: _____ DATE/TIME: _____

RECEIVED FOR LAB BY: [signature] DATE/TIME: 7/21/05 9:40

PLEASE RETURN ORIGINAL SAMPLE ANALYSIS REQUISITION

STL Cooler Receipt Form/Narrative Lot Number: G5G200173
North Canton Facility

Client: STL Sacramento Project: Quote#:
Cooler Received on: 7/21/05 Opened on: 7/21/05 by: (Signature)

Fedx [X] Client Drop Off [ ] UPS [ ] DHL [ ] FAS [ ] Other:
STL Cooler No# Foam Box [X] Client Cooler [ ] Other
1. Were custody seals on the outside of the cooler? Yes [X] No [ ] Intact? Yes [X] No [ ] NA [ ]
If YES, Quantity 1
Were the custody seals signed and dated? Yes [X] No [ ] NA [ ]
2. Shipper's packing slip attached to this form? Slip Unsalvageable Yes [ ] No [X] NA [ ]
3. Did custody papers accompany the samples? Yes [X] No [ ] Relinquished by client? Yes [X] No [ ]
4. Did you sign the custody papers in the appropriate place? Yes [X] No [ ]
5. Packing material used: Bubble Wrap [X] Foam [ ] None [ ] Other:
6. Cooler temperature upon receipt 4.1 °C (see back of form for multiple coolers/temp)
METHOD: Temp Vial [ ] Coolant & Sample [ ] Against Bottles [ ] IR [X] ICE/H_2O Slurry [ ]
COOLANT: Wet Ice [X] Blue Ice [ ] Dry Ice [ ] Water [ ] None [ ]
7. Did all bottles arrive in good condition (Unbroken)? Yes [X] No [ ]
8. Could all bottle labels and/or tags be reconciled with the COC? Yes [X] No [ ]
9. Were samples at the correct pH? (record below/on back) Yes [ ] No [ ] NA [X]
10. Were correct bottles used for the tests indicated? Yes [X] No [ ]
11. Were air bubbles >6 mm in any VOA vials? Yes [ ] No [ ] NA [X]
12. Sufficient quantity received to perform indicated analyses? Yes [X] No [ ]
Contacted PM Date: by: via Voice Mail [ ] Verbal [ ] Other [ ]
Concerning:

√	
	1. CHAIN OF CUSTODY
	The following discrepancies occurred:
	2. SAMPLE CONDITION
	Sample(s) were received after the recommended holding time had expired.
	Sample(s) were received in a broken container.
	3. SAMPLE PRESERVATION
	Sample(s) were further preserved in sample receiving to meet recommended pH level(s). *Nitric Acid Lot # 051105-HNO3; Sulfuric Acid Lot # 102804-H2SO4; Sodium Hydroxide Lot # -041305 -NaOH; Hydrochloric Acid Lot # 100504-HCl; Sodium Hydroxide and Zinc Acetate Lot # 071604-CH3COO2ZN/NaOH*
	Sample(s) were received with bubble > 6 mm in diameter (cc: PM)
	4. Other (see below or back)

Client ID	pH	Date	Initials

SOP: HC-SC-0005, Sample Receiving
N:\QAQC\WARRATTY\STL\Cooler Receipt STL\COOLSR_STL_Rev#9 062205.doc

SOLID, 8260B, Vol. Org.
TCLP NCanton

Parsons Corporation

Client Sample ID: IDW56

TCLP GC/MS Volatiles

Lot-Sample #...: G5G200173-001 Work Order #...: HFV091AA Matrix.....: SD
Date Sampled...: 07/19/05 Date Received..: 07/20/05
Leach Date.....: 07/21/05 Prep Date.....: 07/22/05 Analysis Date..: 07/22/05
Leach Batch #..: P520203 Prep Batch #...: 5205022
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	0.025	mg/L	0.00023
Carbon tetrachloride	ND	0.025	mg/L	0.00045
Chlorobenzene	ND	0.025	mg/L	0.00028
Chloroform	ND	0.025	mg/L	0.00040
1,2-Dichloroethane	ND	0.025	mg/L	0.00048
1,1-Dichloroethylene	ND	0.070	mg/L	0.00060
Methyl ethyl ketone	ND	0.25	mg/L	0.0010
Tetrachloroethylene	ND	0.070	mg/L	0.00083
Trichloroethylene	ND	0.050	mg/L	0.00041
Vinyl chloride	ND	0.025	mg/L	0.00044

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	107	(86 - 125)
1,2-Dichloroethane-d4	106	(80 - 122)
Toluene-d8	109	(90 - 122)
4-Bromofluorobenzene	93	(84 - 125)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

QC DATA ASSOCIATION SUMMARY

G5G200173

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	SD	SW846 8260B	P520203	5205022	

METHOD BLANK REPORT

TCLP GC/MS Volatiles

Client Lot #...: G5G200173 Work Order #...: HF0QW1AA Matrix.....: SOLID
MB Lot-Sample #: A5G210000-253
Leach Date.....: 07/21/05 Prep Date.....: 07/22/05 Analysis Date..: 07/22/05
Leach Batch #..: P520203 Prep Batch #...: 5205022
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	0.025	mg/L	SW846 8260B
Carbon tetrachloride	ND	0.025	mg/L	SW846 8260B
Chlorobenzene	ND	0.025	mg/L	SW846 8260B
Chloroform	ND	0.025	mg/L	SW846 8260B
1,2-Dichloroethane	ND	0.025	mg/L	SW846 8260B
1,1-Dichloroethylene	ND	0.070	mg/L	SW846 8260B
Methyl ethyl ketone	ND	0.25	mg/L	SW846 8260B
Tetrachloroethylene	ND	0.070	mg/L	SW846 8260B
Trichloroethylene	ND	0.050	mg/L	SW846 8260B
Vinyl chloride	ND	0.025	mg/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(86 - 125)
1,2-Dichloroethane-d4	105	(80 - 122)
Toluene-d8	107	(90 - 122)
4-Bromofluorobenzene	96	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5G200173 Work Order #...: HF6NV1AA-LCS Matrix.....: SOLID
LCS Lot-Sample#: A5G240000-022 HF6NV1AC-LCSD
Prep Date.....: 07/22/05 Analysis Date..: 07/22/05
Prep Batch #...: 5205022
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**95**	**(76 - 118)**			**SW846 8260B**
	97	**(76 - 118)**	**2.3**	**(0-30)**	**SW846 8260B**
Chlorobenzene	**92**	**(76 - 113)**			**SW846 8260B**
	95	**(76 - 113)**	**3.8**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethylene	**94**	**(67 - 128)**			**SW846 8260B**
	97	**(67 - 128)**	**3.3**	**(0-30)**	**SW846 8260B**
Trichloroethylene	**97**	**(76 - 119)**			**SW846 8260B**
	98	**(76 - 119)**	**1.1**	**(0-30)**	**SW846 8260B**
Toluene	**98**	**(72 - 117)**			**SW846 8260B**
	100	**(72 - 117)**	**1.9**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	107	(86 - 124)
	109	(86 - 124)
1,2-Dichloroethane-d4	112	(80 - 122)
	100	(80 - 122)
Toluene-d8	109	(90 - 122)
	113	(90 - 122)
4-Bromofluorobenzene	99	(84 - 125)
	103	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5G200173 **Work Order #...:** HF6NV1AA-LCS **Matrix.....:** SOLID
LCS Lot-Sample#: A5G240000-022 HF6NV1AC-LCSD
Prep Date.....: 07/22/05 **Analysis Date..:** 07/22/05
Prep Batch #...: 5205022
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**0.500**	**0.476**	mg/L	**95**		**SW846 8260B**
	0.500	**0.487**	mg/L	**97**	**2.3**	**SW846 8260B**
Chlorobenzene	**0.500**	**0.458**	mg/L	**92**		**SW846 8260B**
	0.500	**0.476**	mg/L	**95**	**3.8**	**SW846 8260B**
1,1-Dichloroethylene	**0.500**	**0.468**	mg/L	**94**		**SW846 8260B**
	0.500	**0.484**	mg/L	**97**	**3.3**	**SW846 8260B**
Trichloroethylene	**0.500**	**0.485**	mg/L	**97**		**SW846 8260B**
	0.500	**0.491**	mg/L	**98**	**1.1**	**SW846 8260B**
Toluene	**0.500**	**0.489**	mg/L	**98**		**SW846 8260B**
	0.500	**0.498**	mg/L	**100**	**1.9**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	107	(86 - 124)
	109	(86 - 124)
1,2-Dichloroethane-d4	112	(80 - 122)
	100	(80 - 122)
Toluene-d8	109	(90 - 122)
	113	(90 - 122)
4-Bromofluorobenzene	99	(84 - 125)
	103	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

APPENDIX H

PARSONS

406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069

Memorandum

To: Dean Reynolds, TEAD; Larry McFarland, TEAD

Copy: Maryellen Mackenzie, USACE; Carl Cole, USACE; Doug Mackenzie, USACE; Richard Jirik, Parsons; Kurt Alloway, Parsons

From: Amanda Evans, Parsons

Date: Thursday, August 4, 2005

Subject: TEAD SWMU-58 RFI – Waste Management

This letter is to recommend disposition of the waste equipment rinsate and drill produced water in Baker Tank PARSNZ0518101 as detailed in Table One, attached.

The equipment rinsate and drill produced water was sampled as IDW57 and tested for VOCs. Analysis was conducted by Severn Trent Services, Inc, West Sacramento, CA. This laboratory is Utah Certified.

Results have been received as an analytical report and quality control (QC). Parsons has reviewed the data and found the QC to be acceptable. The complete report is attached.

Listed Wastes Analysis:

Carbon tetrachloride was detected at 0.35 ug/L and trichloroethylene at 0.41 ug/L. Therefore it is recommended that the waste be treated as hazardous and coded F001 and F002. Also, chloroform was detected at 0.18 ug/L. No additional waste codes are recommended due to chloroform.

Characteristic Wastes Analysis:

The waste is known to be primarily water. Therefore generator's reasonable knowledge may be used to exclude the characteristic s of ignitability, reactivity and corrosivity.

No analytes were detected in excess of TCLP limits. Therefore no characteristi c waste codes (40 CFR Part 261.24) should be applied.

Land Disposal Restrictions Analysis:

No compounds were detected in excess of LDR limits for wastewater (40 CFR Part 268.48), therefore the waste is suitable for land disposal.

{

Disposition:

It is recommended that the equipment rinsate and drill produced water be disposed in TEAD's groundwater treatment plant. Parsons will arrange to dispose of the waste per your written instructions.

Table One

ContainerID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ051810 1	KLA	YES		6500 GAL	D-17, D-18, D-19	RINSE/DECON WATER/DRILL PRODUCED WATER	6/30/2005	7/21/2005	6/30/2005	9/18/2005			

Sites	Location	Move Date	Manifest ID	Manifest Date
D-17	UID-90	6/30/2005		
D-18				
D-19				

From: McFarland, Larry [mailto:larry.mcfarland@us.army.mil]
Sent: Mon 8/8/2005 1:48 PM
To: Evans, Amanda
Cc: Alloway, Kurt; Kubacki, Steve; Jirik, Richard; Reynolds, Dean (Environmental)
Subject: RE: TEAD IDW Report for IDW57

Amanda,

The Tooele Army Depot (TEAD) Environmental Office has reviewed your memorandum dated August 4, 2005 concerning the recommended disposition of Investigative Derived Waste (IDW) which has been characterized for disposal through sample number IDW57. TEAD concurs with Parsons recommended disposition. Based on the analysis provided, contaminants detected in the decon and development water contained in baker tank # PARSNZ0518101 may be disposed of at Tooele Army Depots Ground Water Treatment System. At your earliest convienience, please make arrangements with the treatment plant operations contractor to dispose of the water.

Thanks
Larry McFarland

-----Original Message-----
From: Evans, Amanda [mailto:Amanda.Evans@parsons.com]
Sent: Thursday, August 04, 2005 1:33 PM
To: Kurt.Alloway@parsons.com; colec@emh2.tooele.army.mil; doug.d.mackenzie@usace.army.mil; Richard.Jirik@parsons.com; Maryellen.Mackenzie@usace.army.mil; mcfarlal@emh2.tooele.army.mil; reynoldd@emh2.tooele.army.mil
Subject: TEAD IDW Report for IDW57

Hello,

You will find attached the report for IDW57. Please contact me if you have any questions or comments.

Thank you,

Amanda M. Evans
Chemist
parsons
406 West South Jordan Parkway, Suite 300
South Jordan, UT 84095
(801)553-3366
(801)572-9069 Fax
<<AME_idw57.pdf>>

SEVERN TRENT STL

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

July 29, 2005

STL SACRAMENTO PROJECT NUMBER: G5G270244
PO/CONTRACT: 744139-30012

Jan Barbas
Parsons
406 West South Jordan Parkway
Suite 300
South Jordan, UT 84095

Dear Mr. Barbas,

This report contains the analytical results for the sample received under chain of custody by STL Sacramento on July 27, 2005. This sample is associated with your Tooelle Industrial Area project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

Preliminary results were sent via e-mail on July 29, 2005.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

Nilo Ligi
Project Manager

TABLE OF CONTENTS

STL SACRAMENTO PROJECT NUMBER G5G270244

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5G270244

General Comments

Sample: 1

Sample was received in good condition at STL Sacramento at 2 degrees C.

Sample was received with a pH of 8. As the sample was analyzed within 7 days (the normal holding time for an unpreserved sample), there is no impact on the data.

SOLID, SW 8260B, Volatile Organics

Sample(s): 1

Sample was analysed by method SW 8260B, gas chromatography/mass spectrometry (GCMS) analysis. All QA/QC criteria were met except as noted below.

Naphthalene we detected in the Method Blank below the reporting limit but above the MDL. This compound was not detected in the sample.

Sample(s): 1

Insufficient volume was available for MS/MSD. An LCS/DCS was prepared instead.

There were no other anomalies associated with this project.

G5G27

SEVERN TRENT **STL**

ACCREDITED IN ACCORDANCE WITH nelac

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0619	Pennsylvania	68-272
Arkansas	04-067-0	South Carolina	87014002
California*	01119CA	Texas	TX 270 2004A
Colorado	NA	Utah*	QUAN1
Connecticut*	PH-0691	Virginia	0178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	9950C, 934
Hawaii	NA	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA29	USDA Soil/Plant	S-48260
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	NY-11666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the
tes are spiked i
ntitation, a itor and co Since ects on
judged by the rec of these gs, there is added forming M methods.
MS/MSD are only performed fo ent or QAP uireme

Control Limits: The repor on laboratory historical da ethod
requirem data q y objectives co esen rtainty of the
test resul

Sample Summary
G5G270244

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
HGC7Q	1	IDW57	7/25/2005 04:00 PM	7/27/2005 09:00 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

CHAIN OF CUSTODY

COC ID:

Project Name:	Tooele Industrial Area	Contractor:	Parsons-SLC	Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069	
Project Manager:	Ed Staes	Installation:	TEAD		
Sample Coordinator:	Kurt Alloway	Sample Program:			

Site ID	Loc ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	ID	IDW57	WW	G	N	1	25-JUL-2005	1600	KLA			3
	Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
		SVLS										

PARSNZ05I8101

D-17, 18, 19 D&W/DECON WOSTER

5-DAY TURN AROUND REQUESTED

RECEIVED IN GOOD CONDITION
UNDER COC
JUL 27 2005
INI:

Relinquished by (Signature)		Date/Time	Received by(Signature)	Date/Time
	FedEx	26 Jul 05/1500		7/27/05 0:8

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Monday, July 25, 2005

SEVERN TRENT **STL**

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Parsons PM NL LOG # _____

LOT# (QUANTIMS ID) G5G270245 QUOTE# 47837 LOCATION WB

		Initials	Date
DATE RECEIVED	7/27/05 TIME RECEIVED 9:00	MM	7/27/05

DELIVERED BY ☑ FEDEX ☐ CA OVERNIGHT ☐ CLIENT
☐ AIRBORNE ☐ GOLDENSTATE ☐ DHL
☐ UPS ☐ BAX GLOBAL ☐ GO-GETTERS
☐ STL COURIER ☐ COURIERS ON DEMAND
☐ OTHER

CUSTODY SEAL STATUS ☑ INTACT ☐ BROKEN ☐ N/A

CUSTODY SEAL #(S) N/A

SHIPPPING CONTAINER(S) ☐ STL ☐ CLIENT ☑ N/A

TEMPERTURE RECORD (IN °C) IR 1☐ 3☑ ☐ OTHER _____

COC #(S) N/A

TEMPERATURE BLANK Observed: N/A Corrected: N/A

SAMPLE TEMPERATURE
Observed: 2 2 2 Average: 2 Corrected Average: N/A

COLLECTOR'S NAME: ☐ Verified from COC ☑ Not on COC

pH MEASURED ☐ YES ☐ ANOMALY ☑ N/A

LABELED BY.....

LABELS CHECKED BY.....

PEER REVIEW _____ ☑ NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING
WETCHEM ☑ N/A
VOA-ENCORES ☑ N/A

☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☑ N/A

☑ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH ☐ N/A
ADEQUATE PRESERVATIVES, TEMPERATURES,

☐ Bluseau ☐ TEMPERATURE EXCEEDED (2 - 6 ☐ N/A

☐ WET ICE ☐ BLUE ICE ☐ NO COOLING AGENTS USED ☐ PM NOTIFIED

Notes: _____

*1 Acceptable temperature range for State of Wisconsin samples is 0 - 6 LEAVE BLANK IF NR. USE "N/A" Sacramento

G5G27

WATER, 8260B, Volatile Organics

Parsons Corporation

Client Sample ID: IDW57

GC/MS Volatiles

Lot-Sample #...: G5G270244-001	**Work Order #...:** HGC7Q1AA	**Matrix.....:** WATER	
Date Sampled...: 07/25/05	**Date Received..:** 07/27/05		
Prep Date.....: 07/27/05	**Analysis Date..:** 07/27/05		
Prep Batch #...: 5209199			
Dilution Factor: 1	**Method.....:** SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	**0.35 J**	**1.0**	**ug/L**	**0.15**
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.18 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**0.41 J**	**1.0**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	99	(70 - 130)
1,2-Dichloroethane-d4	107	(70 - 130)
Toluene-d8	110	(70 - 130)
Dibromofluoromethane	110	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

QC DATA ASSOCIATION SUMMARY

G5G270244

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	SW846 8260B		5209199	

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: G5G270244 **Work Order #...:** HGFJW1AA **Matrix.....:** WATER
MB Lot-Sample #: G5G280000-199

Prep Date.....: 07/27/05
Analysis Date..: 07/27/05 **Prep Batch #...:** 5209199
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	**0.18 J**	**1.0**	**ug/L**	**SW846 8260B**
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	99	(70 - 130)
1,2-Dichloroethane-d4	99	(70 - 130)
Toluene-d8	106	(70 - 130)
Dibromofluoromethane	103	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

J Estimated result. Result is less than RL.

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5G270244 **Work Order #...:** HGFJW1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5G280000-199 HGFJW1AD-LCSD
Prep Date.....: 07/27/05 **Analysis Date..:** 07/27/05
Prep Batch #...: 5209199
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Chlorobenzene	**20.0**	**18.6**	**ug/L**	**93**		**SW846 8260B**
	20.0	**20.3**	**ug/L**	**102**	**9.0**	**SW846 8260B**
Benzene	**20.0**	**19.7**	**ug/L**	**99**		**SW846 8260B**
	20.0	**20.9**	**ug/L**	**104**	**5.8**	**SW846 8260B**
1,1-Dichloroethene	**20.0**	**19.6**	**ug/L**	**98**		**SW846 8260B**
	20.0	**22.2**	**ug/L**	**111**	**13**	**SW846 8260B**
Toluene	**20.0**	**19.5**	**ug/L**	**97**		**SW846 8260B**
	20.0	**21.2**	**ug/L**	**106**	**8.6**	**SW846 8260B**
Trichloroethene	**20.0**	**18.6**	**ug/L**	**93**		**SW846 8260B**
	20.0	**20.2**	**ug/L**	**101**	**8.3**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	86	(70 - 130)
	97	(70 - 130)
1,2-Dichloroethane-d4	89	(70 - 130)
	97	(70 - 130)
Toluene-d8	95	(70 - 130)
	105	(70 - 130)
Dibromofluoromethane	93	(70 - 130)
	100	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5G270244 **Work Order #...:** HGFJW1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5G280000-199 HGFJW1AD-LCSD
Prep Date.....: 07/27/05 **Analysis Date..:** 07/27/05
Prep Batch #...: 5209199
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Chlorobenzene	**93**	**(80 - 120)**			**SW846 8260B**
	102	**(80 - 120)**	**9.0**	**(0-30)**	**SW846 8260B**
Benzene	**99**	**(80 - 120)**			**SW846 8260B**
	104	**(80 - 120)**	**5.8**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethene	**98**	**(80 - 120)**			**SW846 8260B**
	111	**(80 - 120)**	**13**	**(0-30)**	**SW846 8260B**
Toluene	**97**	**(80 - 120)**			**SW846 8260B**
	106	**(80 - 120)**	**8.6**	**(0-30)**	**SW846 8260B**
Trichloroethene	**93**	**(80 - 120)**			**SW846 8260B**
	101	**(80 - 120)**	**8.3**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	86	(70 - 130)
	97	(70 - 130)
1,2-Dichloroethane-d4	89	(70 - 130)
	97	(70 - 130)
Toluene-d8	95	(70 - 130)
	105	(70 - 130)
Dibromofluoromethane	93	(70 - 130)
	100	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

HAZARDOUS WASTE MANIFEST

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. UT3213820894 Manifest Document No. P5012

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
TOOELE ARMY DEPOT ENVIRONMENTAL OFFICE, SJMTE-CS-EO
BUILDING 8, ATTN: DEAN REYNOLDS, TOOELE, UT 84074

4. Generator's Phone (435) 833-3504

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: MP Environmental

6. US EPA ID Number: CAT000624247

C. State Transporter's ID

D. Transporter's Phone 435-843-7902

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
TOOELE ARMY DEPOT ENVIRONMENTAL OFFICE, SJMTE-CS-EO
UTAH INDUSTRIAL DEPOT, JADE ST. AND B. AVE
TOOELE, UT 84074

10. US EPA ID Number: UT3213820894

G. State Facility's ID

H. Facility's Phone 435-833-3504

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. HAZARDOUS WASTE LIQUID, NOS (TCE), 9 NA 3082, PG III		1	TT	8,000	EST P	F001 F002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
A. TRICHLOROETHYLENE
MONITORING WELL D-19 DEVELOPMENT WATER
PARSNZ052010I

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
EMERGENCY CONTACT - TOOELE ARMY DEPOT FIRE DEPARTMENT
ERG # 171 435-833-2015

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: Larry McFarland | Signature: Larry McFarland | Month Day Year: 07 21 05

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Ron Porter | Signature: Ron Porter | Month Day Year: 07 21 05

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: Mark D Reynolds | Signature: Mark D Reynolds | Month Day Year: 07 21 05

Style F15 LABELMASTER® (800) 621-5808 / www.labelmaster.com

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete

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TRANSPORTER #2